



RIDGE

**NAYLAND HOUSE
FIRE STRATEGY
PHOENIX COMMUNITY HOUSING**
10 January 2022



NAYLAND HOUSE FIRE STRATEGY PHOENIX COMMUNITY HOUSING

10 January 2022

Prepared for

Scott Wise
Phoenix Community Housing

Prepared by

Ridge and Partners LLP
Beaumont House
59 High Street
Theale
Reading
RG7 5AL

Tel: 0118 932 3088

Contact

Tony Lawson
Senior Fire Consultant
tonylawson@ridge.co.uk
07766 990537

VERSION CONTROL

VERSION	DATE	DESCRIPTION	CREATED BY	REVIEWED BY
1.0	05.01.2022	Draft Strategy	TL	AB
1.1	10.01.2022	Final Strategy	TL	AB

CONTENTS

1. INTRODUCTION	4
2. LEGISLATION AND GUIDANCE DOCUMENTS	6
2.1. Building Regulations	6
2.2. Regulatory Reform (Fire Safety) Order 2005	6
2.3. Construction Design and Management Regulations 2015	6
3. B1 – MEANS OF WARNING AND ESCAPE	7
4. B2 – INTERNAL FIRE SPREAD – LININGS	8
4.1. Material classifications	8
5. B3 – INTERNAL FIRE SPREAD (STRUCTURE)	9
5.1. Structural fire resistance	9
5.2. Compartmentation	9
5.3. Cavity barriers	10
6. B4 – EXTERNAL FIRE SPREAD	11
6.1. Unprotected areas	11
6.2. External wall materials	11
7. B5 – ACCESS AND FACILITIES FOR FIRE SERVICE	11
8. LIMITATIONS	12

1. INTRODUCTION

Ridge and Partners LLP (Ridge) has been commissioned by Phoenix Community Housing to advise on the fire strategy for Nayland House. The premises is a multi-storey block of general needs residential flats; it consists of ground and seven upper floors. The building has a single staircase and a single lift; the heating system used to be by solid fuel stoves with back boilers each flat having an internal coal store. The coal stores have been converted to a storage cupboard in the internal lobby of each flat.

This project consists of the following:

- To review the plans provided
- To produce a retrospective fire strategy
- To carry out a Type 4 Fire Risk Assessment; now completed

The report has been based on drawings produced by Ridge on 19 October 2021, listed in Table 1. As the design was an interactive process these drawings may not include all recommendations with this report.

DRAWING NUMBER	REVISION	DRAWING DESCRIPTION
5014492-RDG-Z01-00-PL-B-0100---		Nayland House – Existing Ground Floor
5014492-RDG-Z01-00-PL-B-0101---		Nayland House – Existing First Floor
5014492-RDG-Z01-00-PL-B-0102---		Nayland House – Existing Second Floor
5014492-RDG-Z01-00-PL-B-0103---		Nayland House – Existing Third Floor
5014492-RDG-Z01-00-PL-B-0104---		Nayland House – Existing Fourth Floor
5014492-RDG-Z01-00-PL-B-0105---		Nayland House – Existing Fifth Floor
5014492-RDG-Z01-00-PL-B-0106---		Nayland t House – Existing Sixth Floor
5014492-RDG-Z01-00-PL-B-0107---		Nayland House – Existing Seventh Floor
5014492-RDG-Z01-00-PL-B-0108---		Nayland House – Existing Elevations 1 & 2
5014492-RDG-Z01-00-PL-B-0109---		Nayland House – Existing Elevations 3 & 4
5014492-RDG-Z01-00-PL-B-0110---		Nayland House – Existing Elevation 5

Table 1 - Drawings reviewed

This report is based on compliance with the fire safety legislation listed in Section 2 below. It does not include for compliance with any other criteria (e.g. additional client requirements, insurance etc.) unless specifically described in this report.

2. LEGISLATION AND GUIDANCE DOCUMENTS

2.1. Building Regulations

The building would have been subject to approval under the Building Regulations in force at the time of construction. They would have required the design and construction to comply with the functional Requirements as shown below.

- B1 – Means of warning and escape
- B2 – Internal fire spread – linings
- B3 – Internal fire spread – structure
- B4 – External fire spread
- B5 – Access and facilities for fire service

In order to demonstrate compliance with these Requirements, it is conventional that the design was based on standard fire safety design documents. Variations to the guidance given in those documents is permitted, as long as it can be demonstrated to have still met the Requirements shown above.

This report has based the fire strategy of the building on the 2007 Approved Document B (ADB). In situations where the building design varies from the guidance in that document, that has been highlighted and justified in this report.

This report describes the main fire safety issues relating to the building. In any areas that are not mentioned in this report, the design should comply with the guidance of ADB.

2.2. Regulatory Reform (Fire Safety) Order 2005

The completed building is subject to the Fire Safety Order. It will require the Responsible Person for the building to ensure that a fire risk assessment has been carried out by a competent person.

This report should be used to assist that fire risk assessment.

2.3. Construction Design and Management Regulations 2015

This building was constructed prior to the regulations coming into force

3. B1 – MEANS OF WARNING AND ESCAPE

B1 requires that the building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building, capable of being safely and effectively used at all material times.

The provisions for means of escape in these premises are based on the assumptions that:

- a) the fire is likely to occur within a flat or maisonette rather than in the common areas;
- b) there is no reliance on external rescue (e.g. by portable ladder);
- c) the building is provided with a high degree of compartmentation and therefore a low probability of fire spread beyond the dwelling of origin, so that simultaneous evacuation of the building is unlikely to be necessary;
- d) although fires might occur in the common parts of the building, the materials and construction in those parts will prevent the fabric from being involved beyond the immediate vicinity; and
- e) escape routes enable a person confronted by an outbreak of fire to make a safe escape without outside assistance.

Based on the above it would be expected that these flats will have a stay put evacuation strategy whereby only the occupants of the flat involved in fire will evacuate. All occupants of other flats will be able to remain in their flat. However, it will require at least a Type 4 fire risk assessment to confirm if the passive fire protection is appropriate for such a policy to be maintained.

3.1 Means of giving warning

Each flat should be provided with automatic detection and warning in accordance with BS 5839-6 Grade D Category LD2. Where necessary for the operation of automatic vents etc, the common areas should have an automatic detection system conforming to BS 5939-1 Category L5; the system will not need to have any means of giving warning in case of fire nor will there be any manual call points.

3.2 Means of escape

Means of escape in flats falls into two distinct phases:

- a) Within the flat
- b) Within the common areas of the building

3.3 Means of escape in flats

There are two main approaches to the means of escape within the flats either:

- a) There is a protected hall no longer than 9m from the flat entrance door to the door to the furthest habitable room
- b) The distance from the furthest point in any habitable room to the flat entrance door does not exceed 9m; if the flat is open plan the cooker is remote from the entrance door and does not compromise the route to the exit (usually taken to be 1.8m away).

These flats are designed with an internal hallway.

3.3 Means of escape in common corridors and stairs

The preferred option for means of escape is that every flat has alternative means of escape however, a single escape route is acceptable if the storey is served by a single common stair and every flat is separated from the common stair by a protected lobby and the travel distance is no more than 7.5m.

The walls between the flats and the protected lobby are compartment walls the flat entrance doors are required to provide 30 minutes fire resistance and be self-closing with intumescent and cold smoke seals.

Due to the probability of smoke from a flat fire entering the lobby it is necessary for the lobby to be provided with ventilation. The vent should provide 1.5m² and be linked to a detector in the lobby which automatically opens the vent, additionally there should be a 1m² vent at the head of the stairs which is also linked to the detection system. On detection of smoke by a detector in the lobby the vent on the fire floor and the vent at the head of the stair should open. Alternatively the vent at the head of the stairs can be a permanent vent

The common stair should provide a minimum of 30 minutes fire resistance and have self-closing doors fitted with intumescent and cold smoke seals; the doors should be a minimum of 30 minutes fire resisting.

4. B2 – INTERNAL FIRE SPREAD – LININGS

4.1. Material classifications

Although unlikely to be the first materials to ignite, wall and ceiling linings of an enclosure such as a room can have a dramatic effect on the development of a fire and, in particular, the time it takes for the room to become completely involved.

Surface finishes and floor coverings should not comprise of materials that might contribute to surface spread of flame and/or fire or adversely affect the means of preventing such propagation.

The recommendations in relation to surface spread of flame are shown in ADB 2006 (incorporating 2013 amendments) Table 2 below. In each situation it gives two options, for the materials to comply either with the National Class or the European Class. Use of either option would be acceptable.

- National Class would relate to testing under BS 476-7 and gives a result of Class 1, 2 or 3. For Class 0, testing is also needed under BS 476-6 as described below.
- European Class would relate to the material’s classification under BS EN 13501.

LOCATION	NATIONAL CLASS ^{A)}	EUROPEAN CLASS ^{B)}
Small rooms of area not more than 4m ² in residential accommodation or 30m ² in non-residential accommodation	Class 3	D-s3,d2
Rooms, general	Class 1	C-s3, d2
Circulations spaces within dwellings	Class 1	C-s3, d2
Other circulation spaces including the common areas of blocks of flats	Class 0	B-s3, d2

Note:

- a) The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class, unless they have been tested accordingly.
- b) When a classification includes “s3, d2”, this mean that there is no limit set for smoke production and/or flaming droplets/particles.

Table 2 - Classification of linings

In this table, Class 0 is better than Class 1. It is not identified in any BS test standard. A Class 0 product is either:

- Composed throughout of materials of limited combustibility; or
- A material having a Class 1 surface spread of flame and which has a fire propagation index (I) of not more than 12 and a sub-index (i1) of not more than 6.

Ridge recommends that Class 3 products should be avoided where possible.

5. B3 – INTERNAL FIRE SPREAD (STRUCTURE)

5.1. Structural fire resistance

It is important that the structure and key construction elements of a building remain fully functional for a reasonable period of time during a fire. It is obviously beneficial if these elements remain in a serviceable condition after the fire for ease of reinstatement. In addition, a fire should be contained by fire resisting elements of the building to prevent it spreading to other parts of the building. This containment should include voids and cavities that could provide a path for fire.

From the supplied plans ground level datum is 24180 and the finished surface of the highest habitable floor datum is 43415 the height of the building, as measured in accordance with Approved Document B 2006 Diagram C6, gives a height of 19,24m

Following Table A2 of ADB, as the highest occupied floor level is more than 18m above ground level, the structural fire resistance requirements for load bearing elements is 90 minutes.

Structure that only supports a roof does not need any specific fire resistance unless it also supports a fire resisting wall or rooftop plant.

5.2. Compartmentation

The fire resistance performance of compartment walls and floors (or any other parts of the building which are required to prevent fire spread) should be not less than that specified below when tested in accordance with the relevant part of BS 476: Parts 20 to 24 or classified in accordance with BS EN 13501 Parts 2, 3 or 4.

This applies to:

- a. Load-bearing walls, for load-bearing capacity, integrity and insulation from either side;
- b. Non-load-bearing walls and partitions, for integrity and insulation from either side;
- c. Fire doors for integrity from either side, with the exception of doors to lift wells where performance is in respect of exposure of the landing side only;
- d. Floors, for load-bearing capacity, integrity and insulation with respect to exposure of the underside only.

The main elements of compartmentation and the relevant fire performance is summarised below. Any items not described below would be in accordance with Table A1 of ADB.

ELEMENT	FIRE RESISTANCE
Floors	90 minutes
Walls separating flats from other parts of the building including other flats	60 mins (doors in walls to be FD30S)
Enclosure of stairs	30 mins (doors to stairs to be FD30S)
Enclosure of risers	30 mins (doors to risers to be FD30)
External walls	See Section 6 of this report

Table 3 - Fire Compartmentation Requirements

To prevent extensive cavities, concealed cavities i.e. the void between a suspended ceiling and the soffit of the floor above, raised floors that are used for services etc. will require cavity barriers typically installed so as to observe a 20m maximum linear dimension. This includes cavities in external walls where compartment walls or floors abut to the external wall.

All pipes, ductwork and services passing through fire-resisting barriers should be penetration sealed with an appropriate sealing system and/or fire/smoke damper which has been shown by an appropriate test or assessment to maintain the period of the fire resistance of the barrier. The penetration sealing system should be designed and installed in accordance with the recommendations contained within The Association for Specialist Fire Protection (ASFP) "Fire Stopping & Penetration Seals for the Consultation Industry" (commonly referred to as The Red Book).

Any fire and smoke control assemblies should be provided with an appropriate certificate from a recognised third-party accreditation body in order to demonstrate compliance with Regulation 38 of the Building Regulations 2010. Assessment and test evidence should also be available for inspection by the approving authorities and other interested parties.

5.3. Cavity barriers

Cavity barriers should be provided in all areas in accordance with Approved Document B.

Within external walls, cavity barriers should be provided in line with any locations where fire rated walls or floors meet the façade.

Cavity barriers should also be provided around all openings in the external walls, such as windows, doors and service penetrations. Cavity barriers should be provided around service penetrations through the external walls in accordance with Building Control Alliance (BCA) Technical Guidance Note 26.

Cavity barriers in external walls should pass through all insulation and other materials within the external wall, forming a seal between the edge of the fire rated wall/floor and the inner face of the external cladding. If the external cladding comprises composite panels which contain materials that are not of limited combustibility, the cavity barrier should be extended to continue through the core of the external panel as well (to prevent the combustible core of the panel bypassing the cavity barrier).

Cavity barriers should achieve a fire resistance of at least 30 minutes for integrity and 15 minutes for insulation. Alternatively, if located in a stud wall or partition, or provided around openings in the external wall, they may be formed of:

- a) Steel at least 0.5mm thick
- b) Timber at least 38mm thick

- c) Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
- d) Calcium silicate, cement-based or gypsum-based boards at least 12mm thick.

Fire stopping (the seal between the fire rated wall/floor and the external wall) should be of the same fire resistance as the fire rated wall/floor.

6. B4 – EXTERNAL FIRE SPREAD

6.1. Unprotected areas

When a building is on fire, heat will radiate through non-fire-resisting openings in the external walls. This heat can be intense enough to set fire to adjoining buildings. In order to reduce the chance of this occurring, the Building Regulations place limits on the area of external elevation with no fire resistance. This area is known as the 'unprotected area' and is affected by such factors as distance from the boundary, use of the building and compartment size. Provided that the unprotected area of the external walls has not been altered since construction no action should be required on this area.

6.2. External wall materials

The external surfaces of the building should comply with the guidance of Diagram 40 of ADB. That essentially means that the external walls should achieve a UK Class 0 or European Class B rating for surface spread of flame.

As the building is more than 18m to the highest habitable floor Approved Document B recommends restricting the combustibility of materials used within external walls to materials of limited combustibility. Alternatively, they must achieve the performance criteria contained in BRE report BR 135 using full scale test data from BS 8414.

7. B5 – ACCESS AND FACILITIES FOR FIRE SERVICE

In order to extinguish a fire within a building it is important that the fire service can gain access onto the premises, and from there, into the building. However, the Fire Safety Order only requires that facilities provided for fire fighters are maintained, therefore provided that nothing is done to reduce fire service access to the building or to remove any hydrant in the vicinity of the premises, without the prior consent of the Fire Service nothing, more will be required.

8. LIMITATIONS

Our advice is strictly limited to the scope of our current brief, i.e. to provide a fire safety strategy for Nayland House.

Ridge have not reviewed any other issues within the project other than those identified in our report. We offer no comment on the adequacy or otherwise of any other aspects of the development (whether related to fire safety or any other issue) and any absence of comment on such issues should not be regarded as any form of approval. The advice should not be used for buildings other than that named in the title.

Prepared by:



Tony Lawson

BSc(Hons) FIFireE
Senior Fire Consultant
Ridge and Partners LLP

Reviewed by:



Andrew Booker

MRICS
Technical Associate
Ridge and Partners LLP



RIDGE



www.ridge.co.uk