



Channing School

RIBA Stage 2 Fire Strategy



Written Record

Revision	Description	Date	Author	Checked by	Authorised by
00	RIBA Stage 2	15/11/2023	Donte Harrow	Mark Davison	Mark Davison

Semper
20 Farringdon Street
London
EC4A 4AB
UK

Tel: +44 (0) 203 858 0173

Semper Fire Engineering Ltd
09661012
www.sempergrp.com

This document is confidential and for the exclusive benefit of the Channing School as the client. It may not be assigned to or relied upon by a third party without the agreement of the client.

Table of Content

1. Introduction.....4

2. Fire Safety Design Approach.....4

3. Package of Fire Protection Measures.....7

4. Means of Escape.....7

5. Internal Fire Spread.....8

6. External Fire Spread.....8

7. Access and Facilities for the Fire Service.....9

1. Introduction

1.1. Project Outline

- 1.1.1. Semper has been appointed by the Channing School to provide fire safety engineering advice for the redevelopment of the main school building and Brunner House, which form part of the site.
- 1.1.2. The project will see the refurbishment of the main school building, with revised access and circulation spaces. In addition, the neighbouring Brunner House will undergo substantial remodelling and extension.
- 1.1.3. The report outlines the fire safety provisions to support the concept stage. They are aimed at demonstrating compliance with the functional requirements of Part B of the Building Regulations 2010 (as amended). The measures recommended in this report are not exhaustive and are subject to change as the scheme develops.
- 1.1.4. Compliance with the relevant fire safety requirements in the Building Regulations can be achieved by compliance with relevant guidance. However, most guidance is directly applicable to typical building types, and there are alternative engineering and design methods which can be used to demonstrate compliance with the intent of relevant fire safety requirements in the Building Regulations.
- 1.1.5. This fire strategy therefore considers the total fire safety package within the scheme to provide a functional and practical fire safety solutions. The strategy draws on prescriptive standards as a basis for design; however, it is only through utilising a combination of established guidance, fire engineering, and technical experience that an adequate degree of fire safety can be achieved – while also complying with the intent of relevant fire safety requirements in the Building Regulations.

1.2. Project Stakeholders

- 1.2.1. Design coordination has been progressed with the following design team.

Discipline	Company
Client	Channing School
Architect	NVB Architects
Structural Engineer	HTS
Project Manager	Stace LLP

Table 1: Project Design Team

2. Fire Safety Design Approach

2.1. Applicable Legislation

- 2.1.1. The proposed works are defined as “building work” in the Building Regulations 2010 (as amended). Therefore, in terms of Fire Safety, the works are required to comply with the functional requirements written in Parts B1 to B5 of Schedule 1 of the Building Regulations 2010 (as amended) as follows:
- 2.1.2. The scheme does not qualify as a ‘higher-risk building’ under the Fire Safety Act and is not defined as a ‘relevant building’ under Regulation 7(4).

2.2. Design Guidance

- 2.2.1. Conventional educational premises are designed under BB 100, which provides functional guidance on fire safety. Nevertheless, the guidance in BB 100 is not appropriate for all types of building and it is recognised that there are alternative ways of satisfying the functional requirements by adopting a fire engineered approach. This is particularly so for refurbished buildings, or designs that are constrained by heritage or existing structural considerations.
- 2.2.1.1 In these cases, a fire engineered approach should be adopted, which considers the total package of fire safety measures to deliver a safe and functional design. Such solutions will follow the formal framework outlined within BS 7974, Application of fire safety engineering principles to the design of buildings – Code of practice.

3. Site Description and Proposed Works

3.1. Site Description

- 3.1.1. The school complex is located off Highgate Hill in North London as illustrated in Figure 1. Access to the main building is from The Bank, with rear access to the site from Cholmeley Park.



Figure 1: Site Plan

3.2. Proposed Works

- 3.2.1. The school complex comprises a series of buildings. This report focuses on the refurbishment of the main school building located on the southeast of the site and the remodelling of the Brunner Building to the northeast.

3.3. Main Building

- 3.3.1. The main school building comprises a basement, ground plus three upper floors. Given the level changes across the site, the floors in the central portion of the building are designated with integers and the floors in the west portion with decimals (i.e. Level 3 and Level 3.5, etc).
- 3.3.2. The refurbishment of the main school building will not involve major structural changes and although material to the Building Regulations, the goal will be to ensure that the conditions are no less satisfactory than before the works were undertaken.
- 3.3.3. The following subsections describe the layout, focusing on the means of escape and nature of the compartmentation. The western portion is addressed first, followed by the central portion.

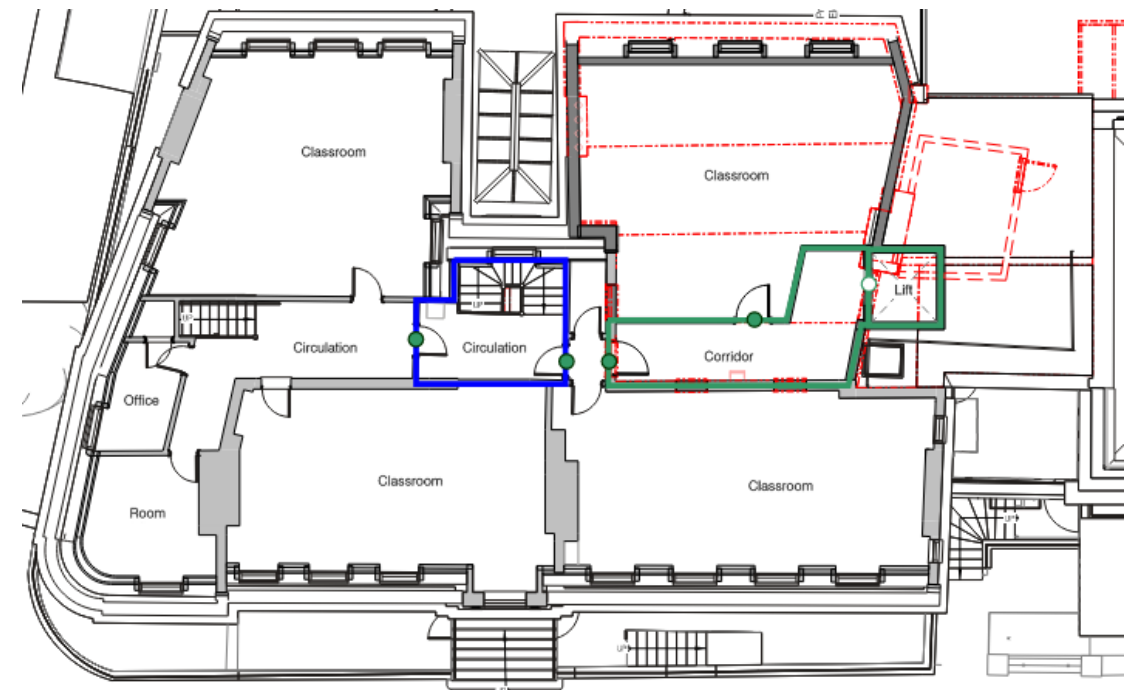


Figure 2: Main Building Level 3.5 (West)

- 3.3.4. Level 3.5 consists of four classrooms, an office, an ancillary room and circulation corridors. The classrooms are understood to accommodate c. 60 students in total, with a further 10 staff members.
- 3.3.5. Level 3.5 is served by a primary escape stair and a secondary accommodation stair that leads to the floor below. A lift is provided for circulation purposes.

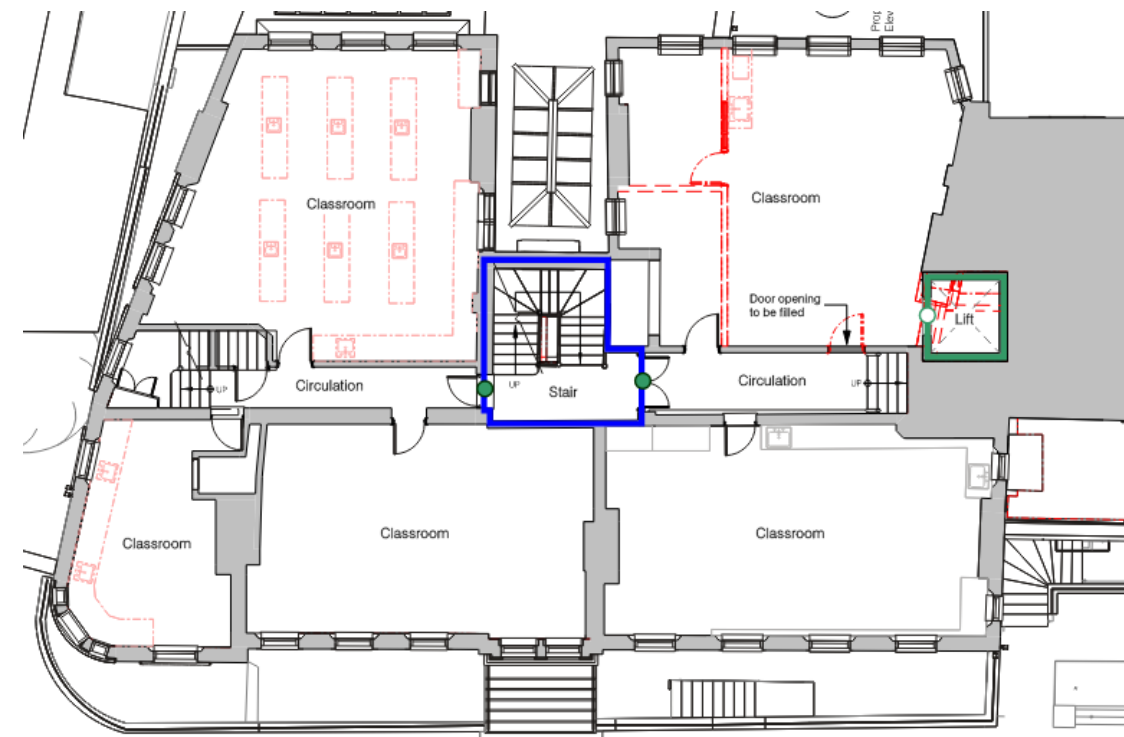


Figure 3: Main Building Level 2.5 (West)

- 3.3.6. Level 2.5 below has five classrooms and an expected occupancy of 70 people. The main central stair facilitates escape, which is also available via the main corridor leading to the central space and a further stair. The arrangement of Level 1.5 is similar, albeit with a library.
- 3.3.7. The arrangement of levels 3.5 and 2.5 is unconventional. The accommodation stair between the two levels would not be considered a suitable escape route under BB 100. Nevertheless, the arrangement will be retained under the proposed works and the conditions are no less satisfactory.
- 3.3.8. The main access is at Level 0.5, which consists of five classrooms, circulation space and WCs. Escape from the main stair is through the entrance lobby onto The Bank.
- 3.3.9. A further level below (B0.5) is served by the main stair and a secondary escape stair to the rear.
- 3.3.10. For the central portion, Level 3 consists of the Art Room and ancillary spaces. Two stairs facilitate escape, and a lift is provided to aid circulation.

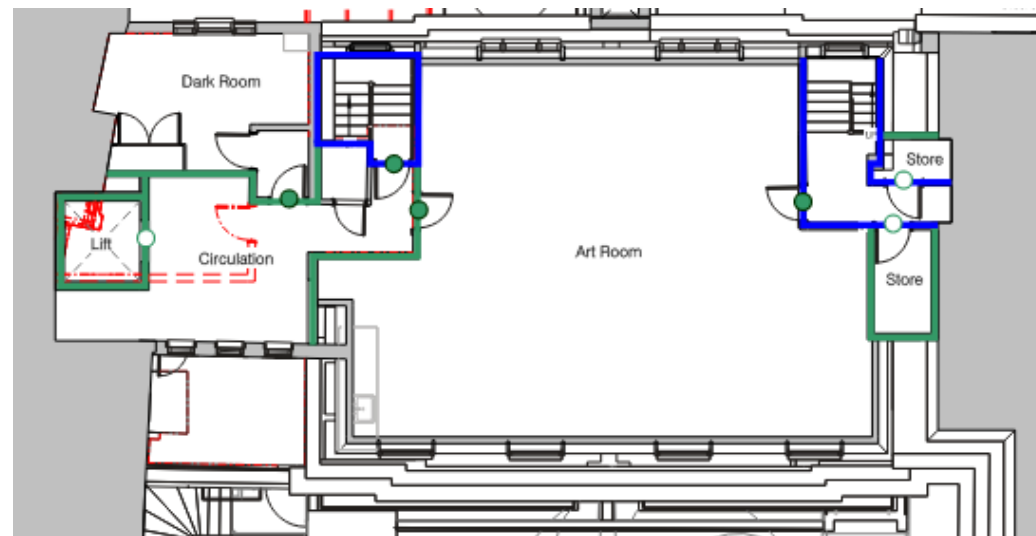


Figure 4: Main Building Level 3 (Central)

- 3.3.11. Level 2 consists of the Staff Room and ancillary spaces. Two stairs facilitate escape, and a lift is provided to aid circulation.

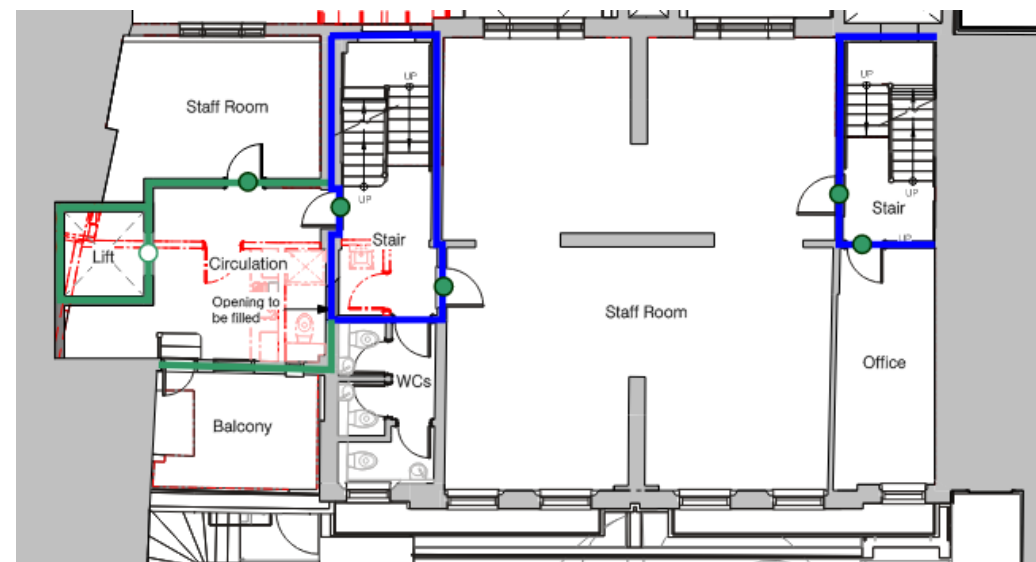


Figure 5: Main Building Level 2 (Central)

- 3.3.12. Level 1 contains the main library and is served by two stairs and a lift.
- 3.3.13. The stairs discharge at Level 0 onto The Bank, with alternative escape/access from the rear.

3.4. Brunner Building

- 3.4.1. The existing Brunner Building comprises ground and first floor, which is served by a single stair, with classrooms accessed from a main circulation corridor.

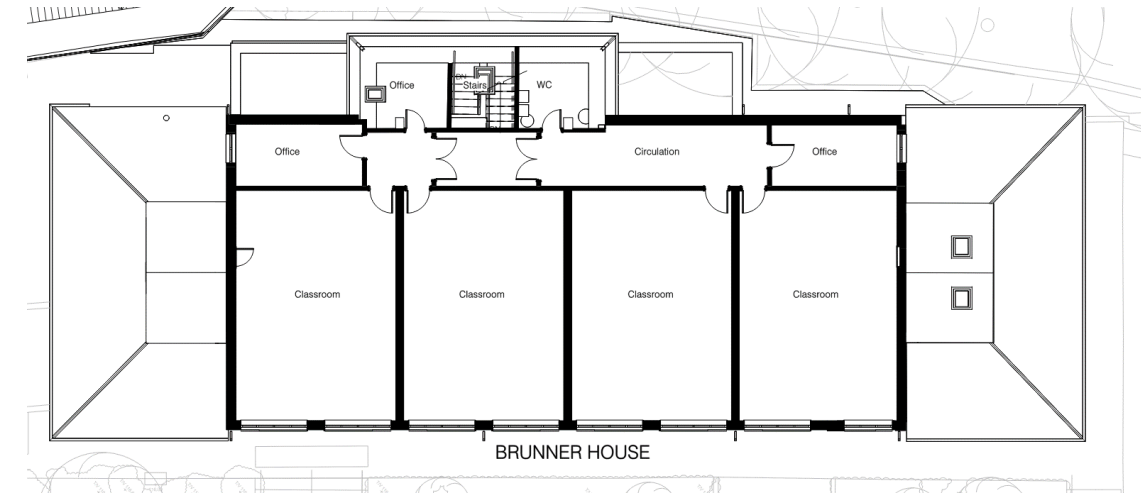


Figure 6: Exist Brunner Building (Level 1)

- 3.4.2. The works will see the partial demolition of the existing building, with a new extension and remodelling throughout. The new building will comprise a partial basement level housing a DT workshop and office, a ground floor and first floor accommodating science classrooms and ancillary spaces.

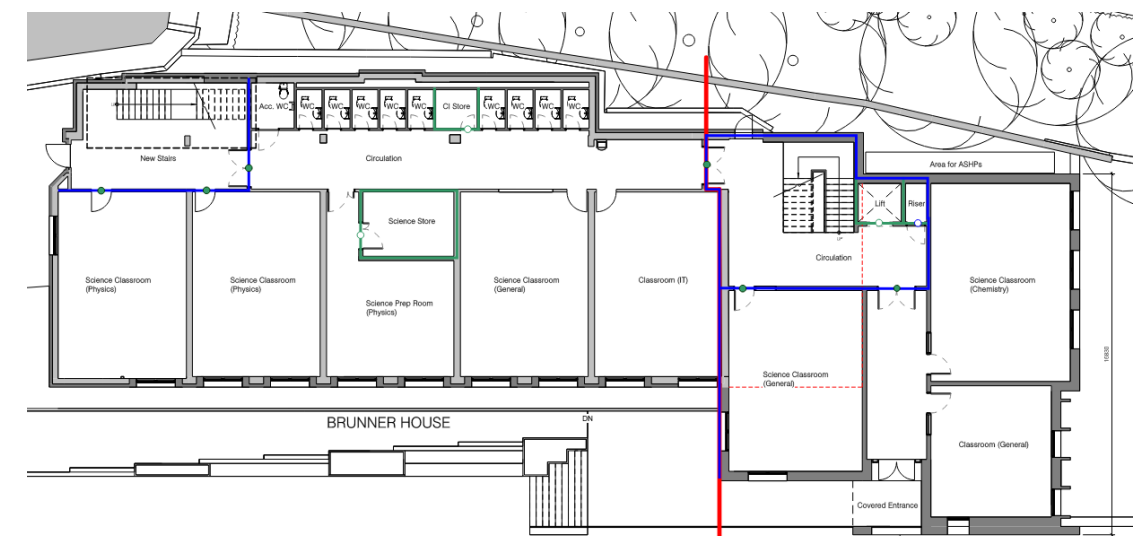


Figure 7: Ground Floor Layout of Brunner House

- 3.4.3. The redesign will see the incorporation of two protected stairs, which will discharge via protected routes to outside. This is a substantial improvement over the current building.
- 3.4.4. The ground and first floors each have eight classrooms, plus ancillary accommodation. Each floor is expected to accommodate 240 students, plus 24 teaching staff, equating to 264 people in total.

4. Package of Fire Protection Measures

4.1. Automatic Fire Detection & Alarm System

4.1.1. A Category L3 fire alarm and detection system will be installed throughout both buildings in accordance with BS 5839-1.

4.2. Emergency Signage

4.2.1. Fire safety signs will be installed where necessary to provide clear identification of fire precautions, fire equipment and means of escape in accordance with BS 5499-4.

4.3. Emergency Lighting

4.3.1. Emergency lighting will be installed in accordance with the relevant parts to BS 5266-1.

4.4. Provisions for Disabled Occupants

4.4.1. Disabled refuges shall be 1400 mm x 900 mm and located within each stair in the Brunner Building A system of two-way communication between each refuge area shall be linked with the reception. The system shall be designed, installed, and commissioned in accordance with BS 5839-9.

4.4.2. A combined passenger/evacuation lift will be provided in the north core of Brunner Building. The lift shall be designed in accordance with BS EN 81-76 (draft) and provided with emergency power supplies for 30 minutes operation.

4.5. Doors and Escape Corridors

4.5.1. Any doors on escape routes, including the external gates (whether it is a fire door or not) should not be fitted with a latch, lock or bolt fastening, or be fitted with simple fastenings that can be readily opened from the side that is approached by occupants escaping. Where more than 60 people are expected to use a door the inclusion of panic hardware is recommended

4.5.2. The final exit door should be fitted with panic hardware in accordance with BS EN 1125.

4.5.3. Electronically powered locks should return to the unlocked position on operation of the AFD system, loss of power and/or activation of a manual door release unit (Type A – BS EN 54-11). Locked security doors must failsafe unlocked upon fire alarm activation and must be provided with the relevant override switch (i.e., emergency green break-glass), designed in accordance with BS 7273-4. Firefighting stair doors should not be secured.

4.6. Smoke Control

4.6.1. The partial basement level of the Brunner Building will be ventilated directly to outside via the normal access/escape doors. It is not proposed to introduce additional smoke control provisions, albeit this is subject to consultation with the relevant building control body.

4.6.2. No further smoke control provisions are envisaged across the buildings in question.

5. Means of Escape

5.1. Escape Strategy

5.1.1. A simultaneous evacuation strategy will be employed, whereby occupants are evacuated on confirmed fire detection.

5.2. Travel Distances

5.2.1. The main building provisions will be unaltered. The Brunner Building will be designed to meet the following maximum travel distance recommendations as outlined in Table 2. The travel distances have been based on the relevant risk profile in accordance with BS 9999.

Area	Maximum recommended travel distance (m)	
	In one direction	In more than one direction
Main Accommodation	18	45
Plant/Ancillary	9	18

Table 2: Travel Distances

5.3. Horizontal Means of Escape

5.3.1. The existing escape routes can be retained. The minimum width of new exits should be 1050 mm. New corridors should be at least 1200 mm wide.

5.3.2. Doors into classrooms and ancillary spaces with less than 60 occupants may open against the direction of escape. All other doors should open in the direction of escape.

5.4. Vertical Means of Escape

5.4.1. The existing stairs serving the main building shall be retained. Two 1200 mm wide escape stairs will be provided in the Brunner Building, which can accommodate up to serve up to 285 occupants.

5.5. Final Exits

5.5.1. The final exits from the stairs should be at least as wide as the stair leading to it and discharge via a protected route direct to a place of ultimate safety.

5.6. Assembly Point

5.6.1. All occupants will be instructed to proceed to a pre-defined evacuation zone, which is understood to be the playground. The assembly zone should be located a minimum of 10 m from the premises to avoid interference with the Fire Service or danger from falling debris, fire and smoke.

6. Internal Fire Spread

6.1. Wall and Ceiling Linings

6.1.1.1 All new wall and ceiling linings should meet the relevant classifications given below in Table 3.

Location	European Class
Small rooms ¹ of area not more than 30m ²	D-s3, d2
Other rooms ²	C-s3, d2
Other circulation spaces	B-s3, d2

Table 3: Minimum Surface Spread of Flame Classifications

7. Structural Fire Resistance

- 7.1.1. There are no significant structural modifications proposed for the main building; however, should the works require structural modification, a 60-minute standard of fire resistance should be maintained.
- 7.1.2. For the Brunner Building, the retained structure should be surveyed to understand its condition and expected fire resistance. The goal is to achieve 60-minute structural fire resistance for new and existing elements.
- 7.1.3. The term ‘elements of structure’ is applied to the main load bearing elements of structure. Structure includes, but is not limited to:
- Structural frame, beams, and columns
 - Load bearing walls (internal and external)
 - Floor structures

7.2. Compartmentation

7.2.1. Table 4 below sets down typical compartmentation provisions for the Brunner Building.

Area	Minutes (REI)
Electrical Rooms	120
Plant/Services	60
Floors	60
Escape Stairs	60
Storage	30

Table 4: Compartmentation

8. External Fire Spread

- 8.1.1. The site is bounded by public highways to the south and west, and neighbouring sites to the north and east.
- 8.1.2. Under the proposed works for the main building, the boundary conditions will not be altered, so no additional provisions are required.
- 8.1.3. The extension of the Brunner Building does however require assessment owing to the increased size of the scheme. Nevertheless, given west elevation is bounded by protected stair enclosures and WC accommodation, the extent of unprotected area is limited to c. 8 x 3 m. From BR 187, the minimum boundary distance based on an enclosing rectangle of 9 x 3 m is 3.5 m. This is comfortably within the defined site boundary as illustrated in Figure 8.

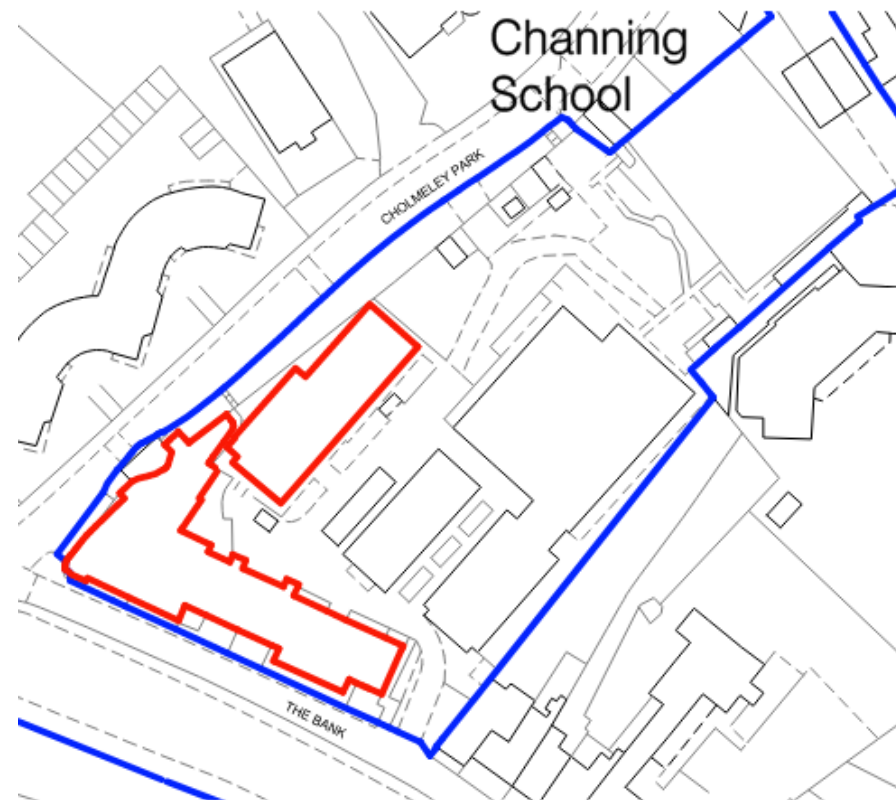


Figure 8: Site Boundary

8.2. External Walls Surface

- 8.2.1. New external walls should be class A2-s1, d0 or better (European).

8.3. External Wall Insulation

- 8.3.1. Any new insulation product used to create the external wall should be constructed with limited combustibility (e.g., Class A2 or better in accordance with EN 13501-1).

8.4. Roof and Terrace

- 8.4.1. Any new roof coverings should be designed to achieve $B_{ROOF}(t_4)$ in accordance with EN 13501-5. Green roofs should be designed in accordance with GRO Green Roof Code and incorporate the following.

9. Access and Facilities for the Fire Service

9.1. Fire Hydrants

- 9.1.1. Water supplies for firefighting operations will be via existing hydrants. It is expected that fire hydrants will be located within 90 m of the building entrances and provide sufficient water supply for the fire service in the event of a fire. This will be subject to a utilities survey.

9.2. Fire Service Vehicle Access

- 9.2.1. Primary vehicle access is provided along The Bank to the main school building. A secondary gated vehicle access route access is provided off Cholmeley Park to the northwest as illustrated in Figure 9. The access road forks after the entry allowing for vehicle turning if required.

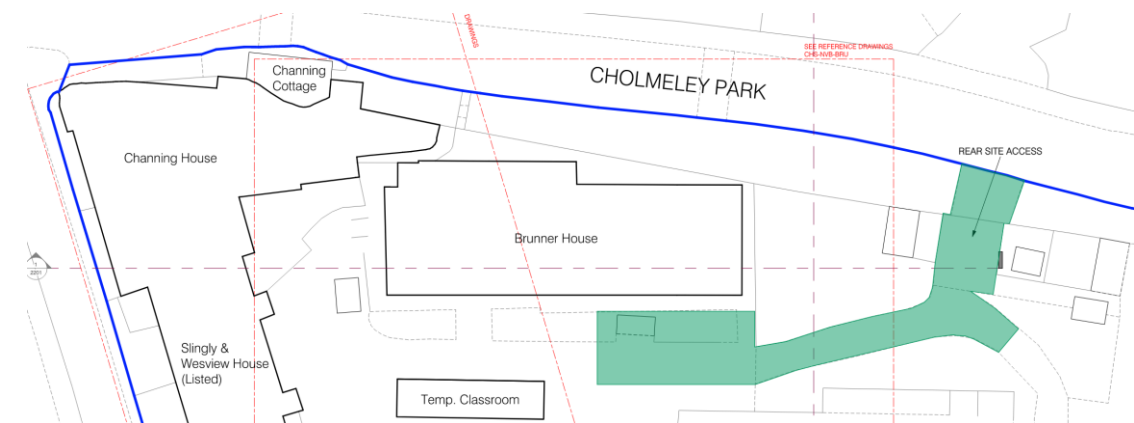


Figure 9: Fire Service Vehicle Access

- 9.2.2. As the Brunner Building is less than 11 m tall and less than 2000 m² in area, vehicle access is required to 15% of the exterior. Access will therefore be provided partially along the east elevation as illustrated in Figure 9. Access is available directly into the building via a door that is not less than 750 mm wide.
- 9.2.3. The vehicle access route should be designed as follows to accommodate a standard pumping appliance:
 - Minimum width of road between kerbs: 3.7 m
 - Minimum width of gateways: 3.1 m
 - Minimum turning circle between kerbs: 16.8 m
 - Minimum clearance height: 3.7 m
 - Minimum carrying capacity: 12.5 tonnes



20 Farringdon Street
London
EC4A 4AB
T: +44 (0) 203 858 0173
E: info@sempergrp.com
W: www.sempergroup.com