Fire
Safety
Engineering
Consultancy

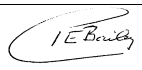
Summerfield House
104 Calverley lane
Leeds LS13 1HE

A FIRE SAFETY STRATEGY

For

155 Drummond Street

Kings Cross London NW1 2PB

Date	Issue no	Prepared by	QA	Signed
12/10/2018	1	Richard Taylor	PB	

FSEC ref 12 /10/2018/RT

FIRE STRATEGY

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Executive Summary

This strategy is provided for discussion by all parties and is completed without any on site or off site testing of the conditions and configurations inherent on the site.

1. Introduction

1.1 General

The following information intends to assist with the identification of fire safety issues related to the proposed construction of 6 residential apartments at 155 Drummond Street and where possible, outline possible solutions.

1.2 Limitations of the report

This report is based on drawings received from Graeme Little Plat-form architects. The purpose of this report is to primarily consider the fire safety requirements of the Building Regulations 2010 and suggest features that can be introduced to assist in gaining Building Regulation approval.

This report is intended to be considered and reviewed by the Client and the Design Team. The recommendations, where possible, should be incorporated into a proposed 'final scheme' for submission to the appointed Building Control Body (BCB and, when deemed suitable by the BCB then be referred to the Local Fire and Rescue Service (LFRS) for consultation, along with relevant drawings etc.

Where there are divergences from recognised guidance, the report seeks to either outline why it is thought that they should be accepted by the BCB, alternatively, compensatory features are usually specified.

The Client and Design Team should be aware that there may be further comments from the BCB and/or LFRS upon submission of amended drawings, which may necessitate further design changes.

1.3 Building Description

The proposals are for a new build which consists of 6 self-contained apartments over eight storeys. There is a single lobbied protected staircase which leads from ground to the fifth floor. The fifth floor which is less than 18m high from ground level gives access to two duplex/triplex apartments. There is a basement which is accessed independently to the apartments which will mainly be used for parking cycles. The building design is to have a lightweight structure consisting of steel and timber framework which will sit on top of a concrete table. The fascia will be a mixture of glazing and light timber/rain screen cladding (full details of the design of the building will be provided by the structural engineer). Access to the flats is via the main entrance doors located on Drummond Street.

2. Relevant Legislation

2.1 Building regulations 2010

The proposal constitutes 'building work' and therefore requires and submission of a Building Regulation application, prior to the commencement of the work.

Sufficient drawings, specifications, consultants' reports etc. must be submitted with the application to demonstrate compliance with the Building Regulations 2010

2.2 The Regulatory Reform (Fire Safety Order)

Upon the completion of the works, the 'Responsible Person' (usually the person or company in control of the premises) will be required to provide a suitable and sufficient documented fire risk assessment for the common areas of the apartments.

2.3 The Housing Ace 2004

Once occupied, the apartments (if tenanted) will be subject to ongoing control via the Housing Act 2004 to ensure that adequate standards are maintained.

2.4 Construction (Design & Management) Regulations 2015

The project falls under the Construction (Design & Management) Regulations 2015. All duty holders must comply with the requirements of the regulations, so as to ensure that appropriate consideration is given to health & safety during the 'pre construction phase', the construction phase and post completion.

3 Means of Warning and Escape

Within the design, consideration must be given to providing early warning of fire and to the provision of adequate means of escape in case of fire, please refer to the extract below from the Building Regulations 2010, Regulation B1;

The building shall be designed and constructed so that there are appropriate provisions for the early warnings 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.

3.1 Fire Alarm and Fire Detection Systems

Within the common stair and corridor areas, automatic fire detection to BS5839 part 1 is required but only for the purposes of activating automatically opening smoke vents. Call points and sounders are not required in these areas, nor does this system need to communicate with fire alarm systems elsewhere in the building.

The guidance within British Standard BS5839 part 6 suggests that individual alarm systems are provided within each of the apartments, comprising of interconnected, mains wired, battery back-up smoke detectors in the apartments' circulation areas and lounge areas and also heat detection in the kitchen. For this scheme, the below provision is suggested:-

Apartments on the first-fourth floors

a. Mains wired battery back-up, interconnected smoke detectors/sounders to be provided within the entrance halls and lounges.
b. Mains wired, battery back-up heat detectors/sounders be provided within kitchen areas.

Duplex/triplex apartments located on the fifth floor

a. The two apartments will be provided with a fire alarm system fitted to Grade D LD1 standard. There will also be sounders/ flashing beacons provided on the roof terraces.

3.2 Horizontal Means of Escape in Case of Fire

3.2.1 The maximum distances of travel suggested within relevant guidance are:

A. 7.5m within the common corridor arears where there is only one escape route available (measured from the flat entry doors to the doors enclosing the common stair).

B. 30M within the common corridor areas where there are two escape routes available (measured from the flat entry doors to the doors enclosing the common stairs).

C. 9m within the flats' internal corridor areas (measured from the furthest door enclosing a room to the flat entrance door).

The dimension within the flat is intended to protect the occupants within the flat itself, the 7.5m and 30m dimensions are intended to limit the distance to a place of relative safety and to restrict the number of flats entering the common corridor area and by doing so, reduce the risk of smoke ingress from the fire source flat in to the common escape area.

3.3 Arrangements within the Flats

The internal layouts of the apartments meet relevant guidance apart from the Duplex/Triplex apartments located on the fifth floor. These apartments have internal stairs which lead from their main entrance doors to roof terraces located on the

second/third floors. Each of these apartments will be provided with 30minute fire doors to the protected staircases and suitable automist/sprinkler systems fitted throughout in accordance with BS8458 2015.

3.4 Vertical Means of Escape in Case of Fire

The common stairs should at all times be a place of relative safety and should be enclosed on each floor level with FD30S fire doors.

The stairs will be provided with lobby protection at each floor level.

The stairs should not serve ancillary accommodation unless the ancillary accommodation is separated from the stairs by a protected lobby, or protected corridor, which has not less than 0.4m² permanent ventilation.

The stairs will be at least 1000mm wide (handrails can be ignored if they protrude less than 100mm). The final width achieved should be checked when detailed stair drawings/handrail design is developed.

The stairs should be substantially non-combustible, if of timber construction, the soffit should be underdrawn and the stringers protected to achieve thirty minutes fire resistance.

3.5 Evacuation Strategy

Provided adequate fire compartmentation is provided between each apartment (including the external wall cavities), the apartments will be suitable for a 'stay put' policy, whereby only the occupants of the flat of fire origin would evacuate and call for assistance of the Fire and Rescue Service.

Upon their arrival, the Fire Service will usually advise whether or not further evacuation if necessary. If an evacuation is necessary, it is likely to be on a phased basis, rather than simultaneous evacuation.

3.6 Escape Provision for People with Disabilities

There is a passenger lift within the scheme; therefore, disabled people/wheelchair users may be present within the upper levels of the building.

Residents with disabilities and/or visitors should only need to evacuate if the fire is within the apartment they are occupying in which case they should make their way to the protected stair enclosure, call the Fire and Rescue Service and await assistance.

3.7 Gas installations

Any gas pipework entering the building will be contained in 60 minute fire-resisting construction.

General Provisions

3.8 Doors on Escape Routes

All doors within the common escape areas should be readily openable (from the escape route side) without the use of a key.

To enable Fire Service assess, any secured entrance doors should release upon the detection of smoke in the stairs or common areas.

All apartment entrance doors will be FD30s

All apartment internal doors will be FD20 apart from the two apartments on the fifth floor which will be FD30.

The dining room /kitchens doors in apartments located on the first – fourth floors will have 30 minute fire resisting pocket doors.

3.9 Emergency Lighting

Emergency Lighting to BS5266 (with 3 hour battery back-up) should be provided within all of the common escape routes, additional fitting should be annotated;

- Within the basement cycle store.

3.10. Exit Signs

As the building has only a single stair, escape routes will be mostly self-evident, 'running man' fire exit signage above the stair entrance doors and above the exit doors should suffice.

3.11 Passenger Lifts

The passenger lift shaft penetrates the fire compartmentation between floor levels and should therefore be enclosed within 1 hour fire compartment walls. The proposals are for the lift to open into the apartments located on the second, third and fourth floors. Therefore the lift doors will be fitted with suitable smoke seals to ensure no smoke can entrain into the apartments.

Upon the activation of the alarm system within the lift shaft, the lift should recall to the ground floor level. The lift will then remain out of service until such time as the building management team or the fire service has been to advise that it is safe to re start its operation.

3.12 Ventilation Systems

Smoke vents (1m^2) will be provided on each floor in the lobbies leading onto the communal stairs. These will be actuated individually by means of smoke detectors in the common access space providing access to the flats. There will also be a vent with a free area of at least 1.m^2 located at the head of the communal stairs.

3.13 Arson attacks

Refuse containers are a common target for would be arsonists. To limit any potential fire size, steel containers are suggested (rather than plastic).

Any openings from the street into the accommodation for ventilation should be protected with a suitable grill to prevent lit items being dropped in to the bin store area.

4.0 Internal Fire Spread (Linings)

Within the design, consideration must be given to the combustibility of internal linings within the building, please refer to the extract below from the Building Regulations 2010, Regulation B2.

To inhibit the spread of flame within the building, the internal linings shall-

a. Adequately resist the spread of flame over their surfaces; and
b. Have, if ignited, a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.

- **In this paragraph 'internal linings' means the materials or products used in lining any partition wall, ceiling or other internal structure.**

The walls and ceiling lining within the common corridor and stair areas should achieve a class '0' spread of flame rating. This can be achieved with plasterboard and skim or similar.

5.0 Internal Fire Spread (Structure)

Within the design, consideration must be given to the fire resistance of internal structural elements and fire compartmentation within the building, please refer to the extract below from the Building Regulations 2010, Regulation B3.

1. **The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable time period.**
2. **A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings. For the purposes of this sub-paragraph a house in a terrace and a semi-detached house are each to be treated as a separate building.**
3. **Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following-**

a. **Sub-division of the building with fire-resisting construction;**
b. **Installation of suitable automatic fire suppression systems.**

4. **The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.**

5.1 Loadbearing Elements

The structural elements of the building (loadbearing walls, steel beams and floors) should be protected to achieve the required 90 minutes fire resistance.

5.2 Compartmentation

Each flat will be split into its own 60 minute fire compartment, with fire resistant floors, walls and ceilings. Further fire compartmentation is also required to the common corridors, stairs, protected shafts and ancillary accommodation.

The provision of adequate fire compartmentation and 90 minute fire resistance to structural elements of the building will require further, more in depth consideration.

Services, soil pipes etc., penetrating the fire compartment walls and floor will need to be suitably protected.

The glazed screens located adjacent to the main entrance doors will not provide suitable fire compartmentation; therefore the proposals are to provide 90 minute fire curtains which will automatically descend on the actuation of a local smoke detector.

5.3 Concealed Spaces (Cavities)

The cavities between the external walls and the inner walls will need to be adequately fire stopped at all party wall, floor and roof junctures. Further consideration of these arrangements will be required.

6.0 External Fire Spread

Within the design, consideration must be given to the potential for fire to spread to adjacent premises, please refer to the extract below from the Building Regulations 2010, Regulation B4.

1. **The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building.**
2. **The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.**

7.0 Access and Facilities for the Fire Service

Within the design, consideration must be given to providing adequate firefighting facilities for the Local Fire and Rescue Service please refer to the extract below from the Building Regulations 2010, Regulation B5.

1. **The building shall be designed and constructed so as to provide reasonable facilities to assist firefighters in the protection of life.**
2. **Reasonable provision shall be made within the site of the building to enable fire appliances to gain access to the building.**

7.1 Fire Mains and Hydrants

Fire hydrants should be available within the streets surrounding the buildings.

Typically, guidance suggests that the Fire Service should be able to access all points within the apartments within 45m of the appliance set down point, this dimension being measured along the route upon which a hose can be laid.

The eighth floor is not within 45m hence a fire main /dry riser will be provided.

7.2 Vehicle Access

There is an access in to the building that can be approached by Fire Service vehicles.

Access to the Building for Firefighting Personnel

- Approved Document B Section 17.2 states buildings with a floor at more than 18m above fire and rescue service vehicle access level, should be provided with firefighting shafts containing firefighting lifts. The fifth floor of the building which gives access to two apartments is less than 18m above firefighting access level. However these apartments are designed as duplex/triplex having two and three floors. The additional protection provided for the occupants/firefighters is by having a suppression system fitted throughout. This added protection provided by a 24 hour, 7 day a week system will provide greater protection than if the apartments only had a single floor with no suppression system. The added protection will also compensates for the added time it will take firefighters to run hose out, even though the distance from the dry riser outlet to the furthest point in the apartments is far less than the acceptable distance of 45m. It should also be noted that even though the lift is not a fire fighting lift it may be used by firefighters to give access to the fifth floor if there was a fire within the duplex/triplex apartments.

8.0 Manual Fire Fighting Equipment

Manual firefighting equipment is not required within the common areas of new build apartments. Such provision could encourage residents to re-enter an affected apartment in order to gather belongings, hence provision is not recommended in these areas.

Manual firefighting equipment should be provided within the;

- Basement cycle store.
- Electric meter room located in the basement.

9.0 Bibliography

The below outlines the main information and documentation referred to in the preparation of the document.

Standards publications

BS5566 – Emergency Lighting Part 1:2016

BS5839 – Fire Detection and Fire Alarm Systems for Buildings Part 1:2017 (within the common areas)

BS5839 – Fire Detection and Fire Alarm Systems for Buildings Part 6:2017 (within the dwellings)

BS9991 – Fire safety in the design, management and use of residential buildings: 2015

Other publications

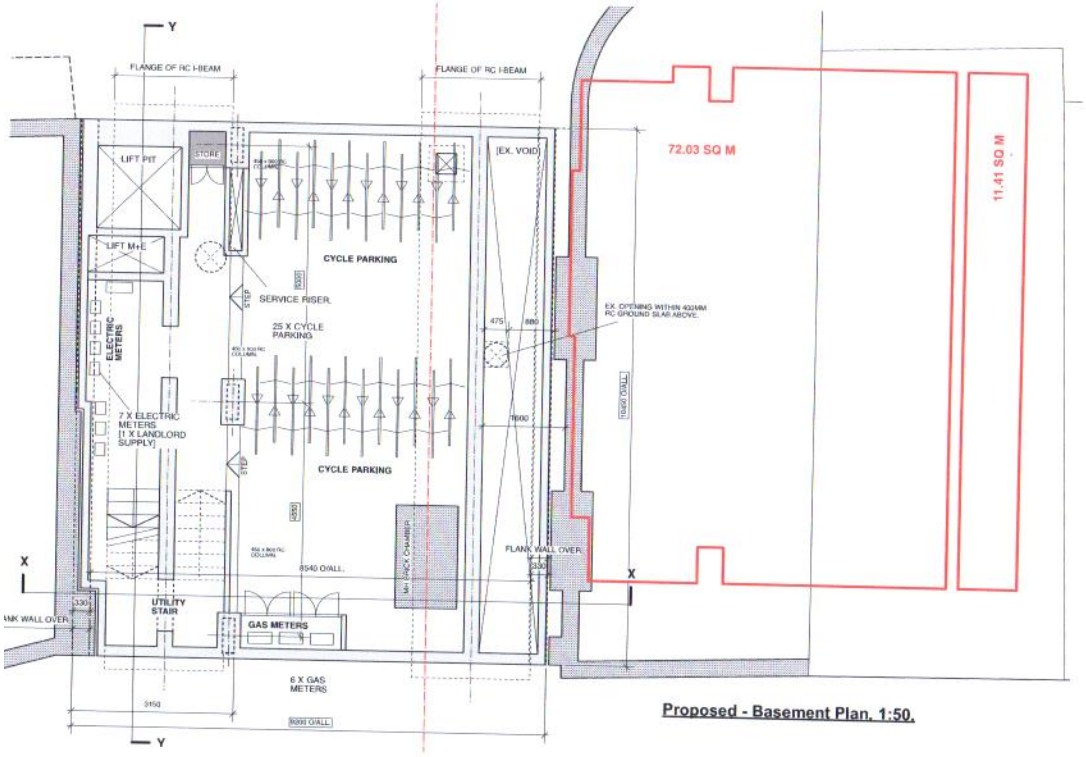
Building Regulations 2010 and subsequent amendments.

The Building Regulations 2010 – Approved document B: Fire Safety

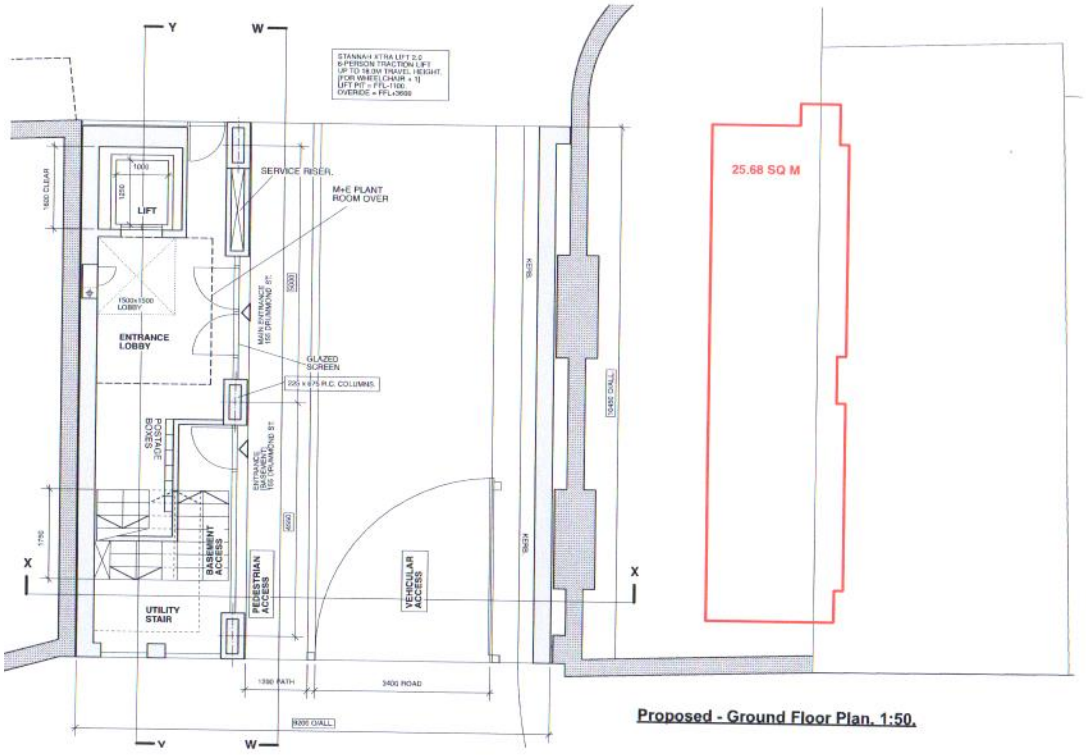
The Regulatory Reform (Fire Safety) Order 2005

Smoke Control Association – Guidance on smoke control to common escape routes in apartment buildings (flats and maisonettes)

FIRE STRATEGY



Proposed - Basement Plan. 1:50.



Proposed - Ground Floor Plan. 1:50.

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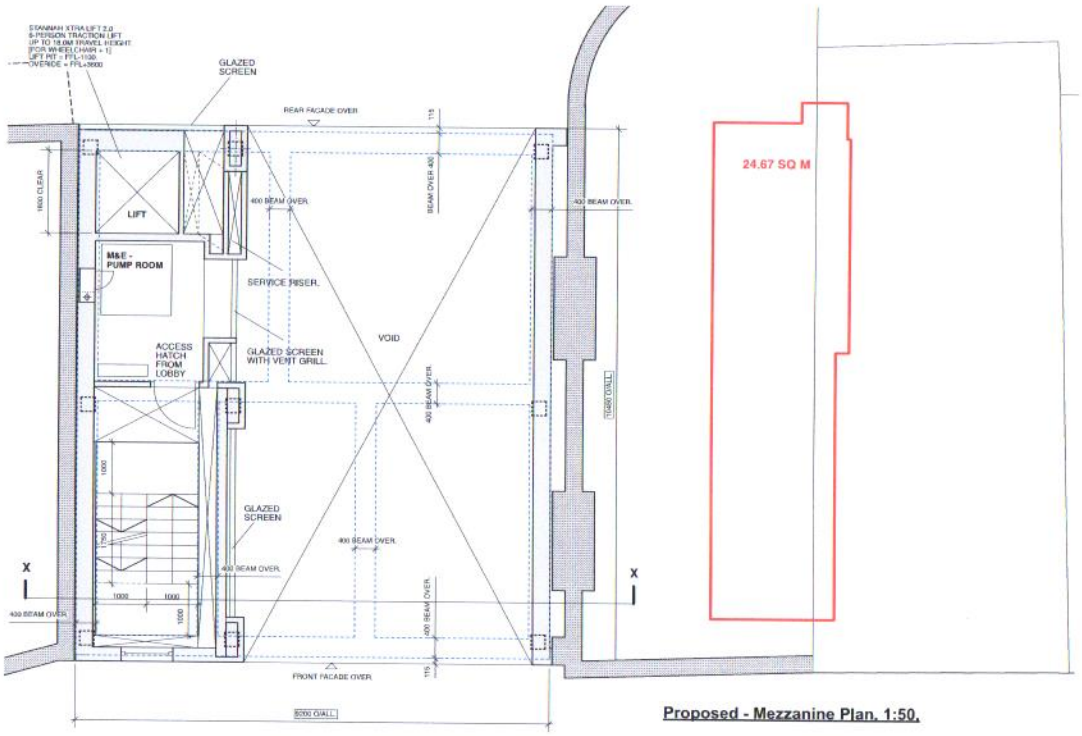
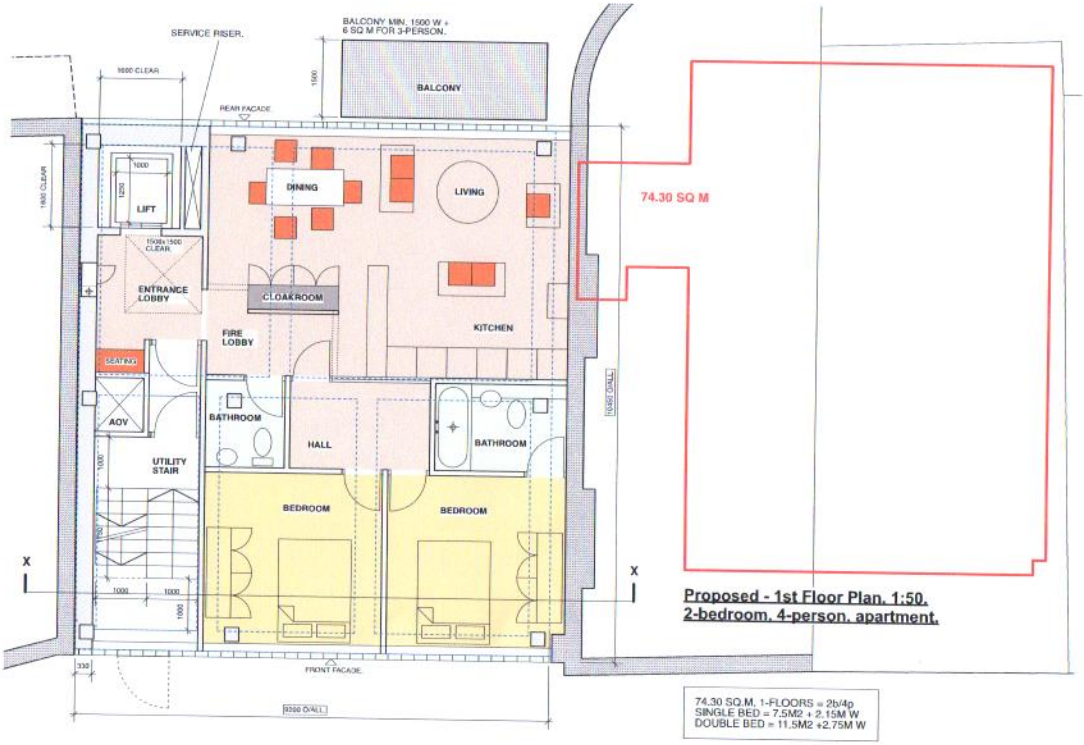


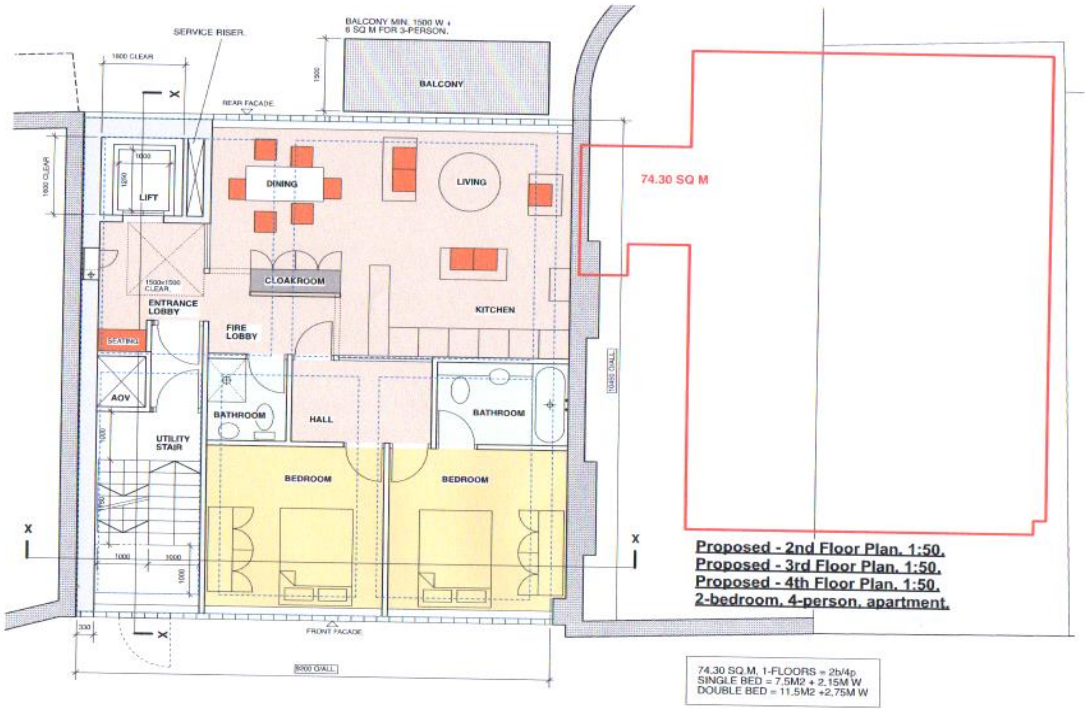
Proposed - Mezzanine Plan, 1:50.

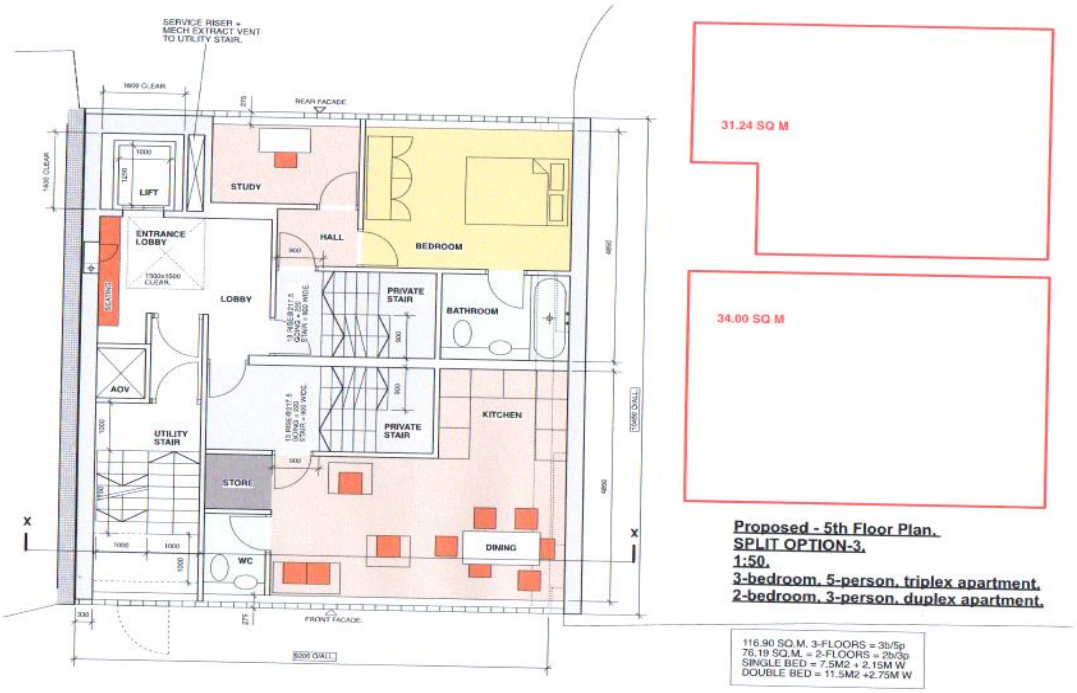


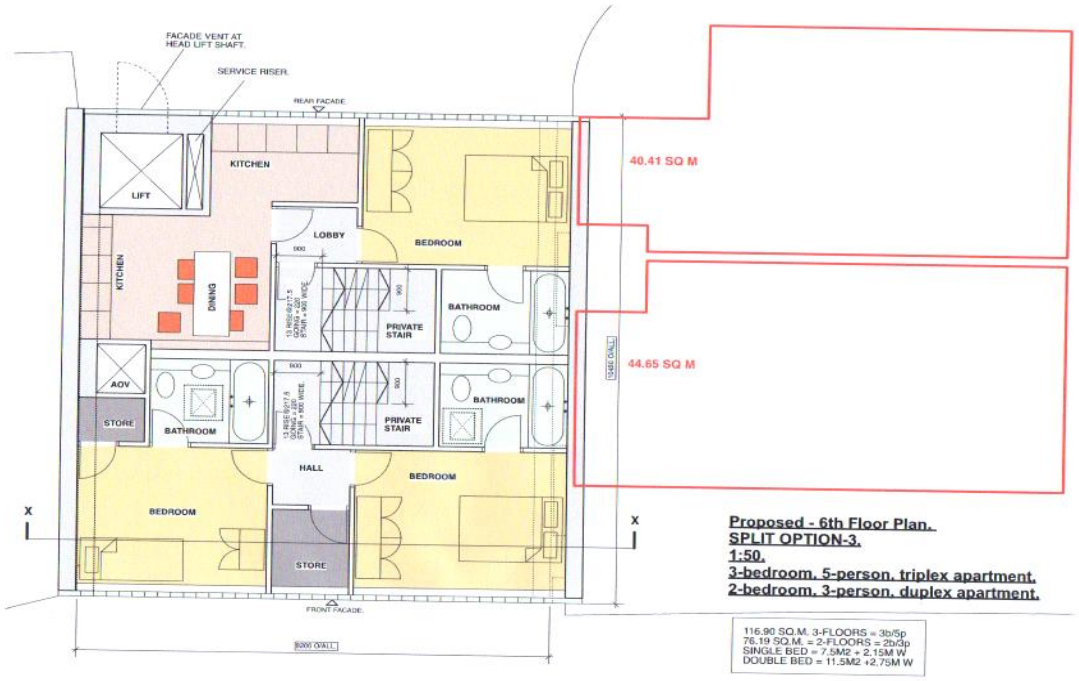
Proposed - 1st Floor Plan, 1:50.
2-bedroom, 4-person, apartment.

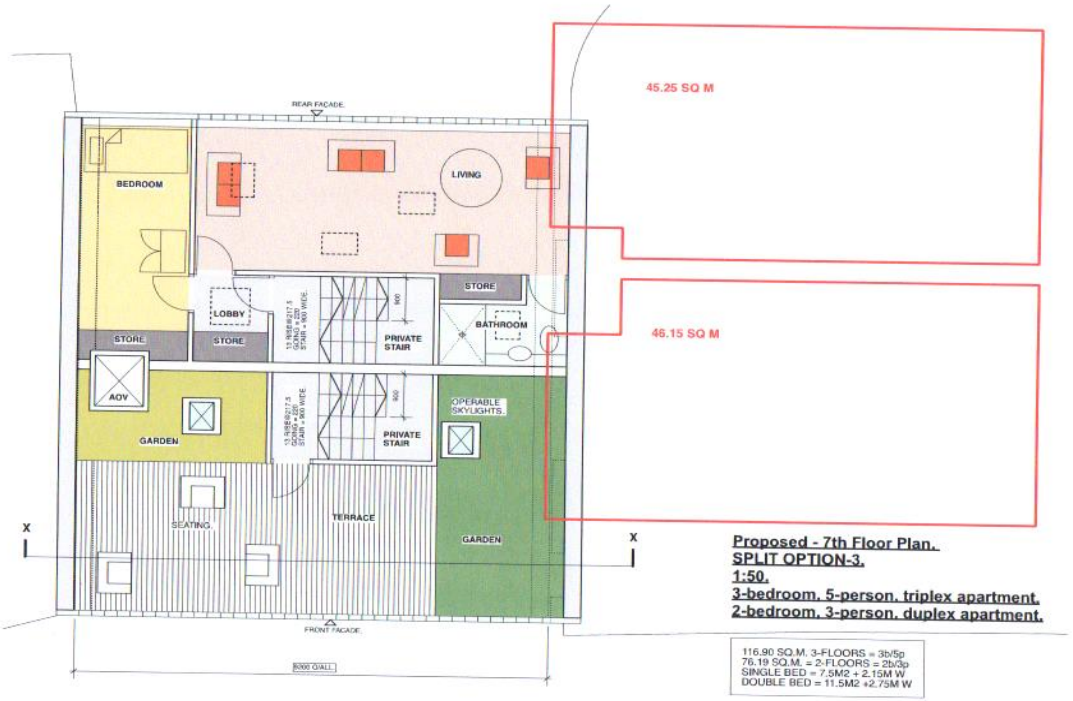
74.30 SQ.M. 1-FLOORS = 2b/4p
SINGLE BED = 7.5M2 + 2.15M W
DOUBLE BED = 11.5M2 +2.75M W

FIRE STRATEGY

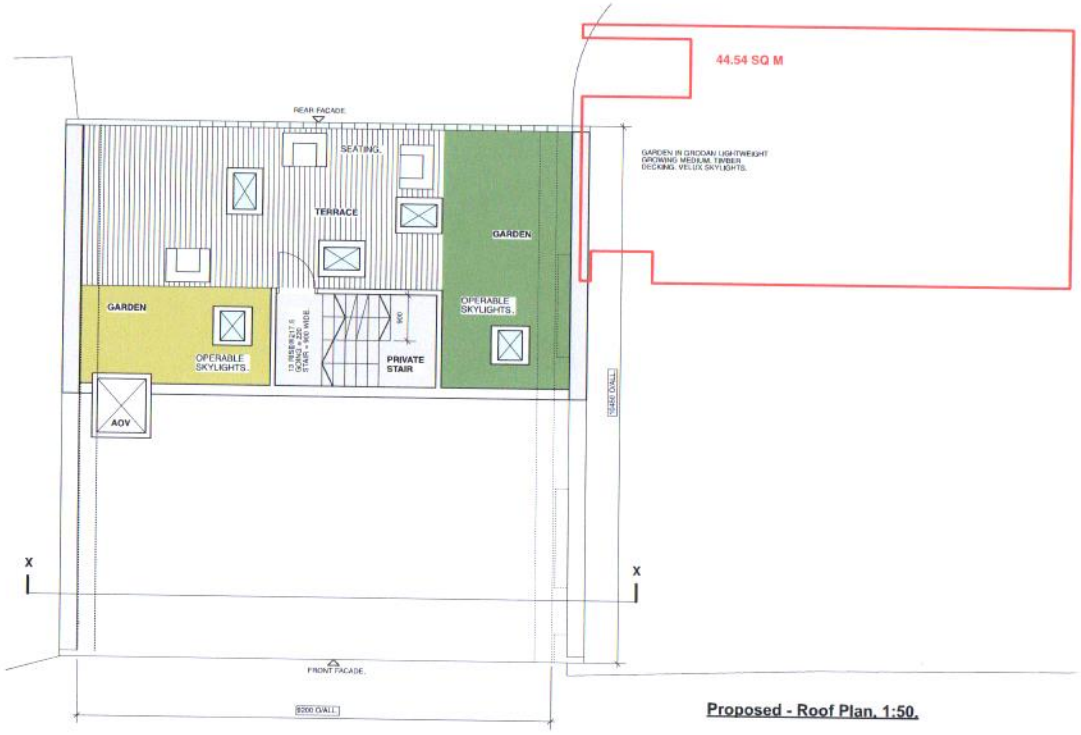





FACADE VENT AT HEAD LIFT SHAFT
SERVICE RISER
REAR FACADE
KITCHEN
LIFT
LOBBY
BEDROOM
KITCHEN
DINING
PRIVATE STAIR
BATHROOM
AOV
STORE
BATHROOM
PRIVATE STAIR
BATHROOM
HALL
BEDROOM
BEDROOM
STORE
FRONT FACADE
40.41 SQ M
44.65 SQ M
Proposed - 6th Floor Plan.
SPLIT OPTION-3.
1:50.
3-bedroom, 5-person, triplex apartment.
2-bedroom, 3-person, duplex apartment.
116.90 SQ.M. 3-FLOORS = 3b/5p
76.19 SQ.M. = 2-FLOORS = 2b/4p
SINGLE BED = 7.5M2 + 2.15M W
DOUBLE BED = 11.5M2 +2.75M W


REAR FACADE
BEDROOM
LIVING
STORE
LOBBY
STORE
STORE
PRIVATE STAIR
BATHROOM
AOV
GARDEN
OPERABLE SKYLIGHTS
PRIVATE STAIR
SEATING
TERRACE
GARDEN
FRONT FACADE
45.25 SQ M
46.15 SQ M
Proposed - 7th Floor Plan.
SPLIT OPTION-3.
1:50.
3-bedroom, 5-person, triplex apartment.
2-bedroom, 3-person, duplex apartment.
116.90 SQ.M. 3-FLOORS = 3b/5p
76.19 SQ.M. = 2-FLOORS = 2b/3p
SINGLE BED = 7.5M2 + 2.15M W
DOUBLE BED = 11.5M2 +2.75M W

FIRE STRATEGY



Proposed - Roof Plan, 1:50.