APEX AIRSPACE

FIRE SAFETY CONSIDERATION IN AIRSPACE PROJECTS

INTRODUCTION

The Fire Safety (England) Regulations apply to all buildings in England that comprise two or more domestic premises (including the residential parts of mixed-use buildings). These buildings are, principally, blocks of flats; the regulations do not apply within individual flats, other than in respect of measures installed within flats for the safety of other residents of the building (e.g., sprinklers, smoke detectors connected to a communal fire alarm system, etc.).

The fire regulations change as the overall height of the building increases; requiring the building to comply with new requirements for fire safety measures. Certain legislation applies only to buildings above 11m and further to buildings above 18m where they are classified as ‘High Rise’ Buildings.

MEASURING BUILDING HEIGHT

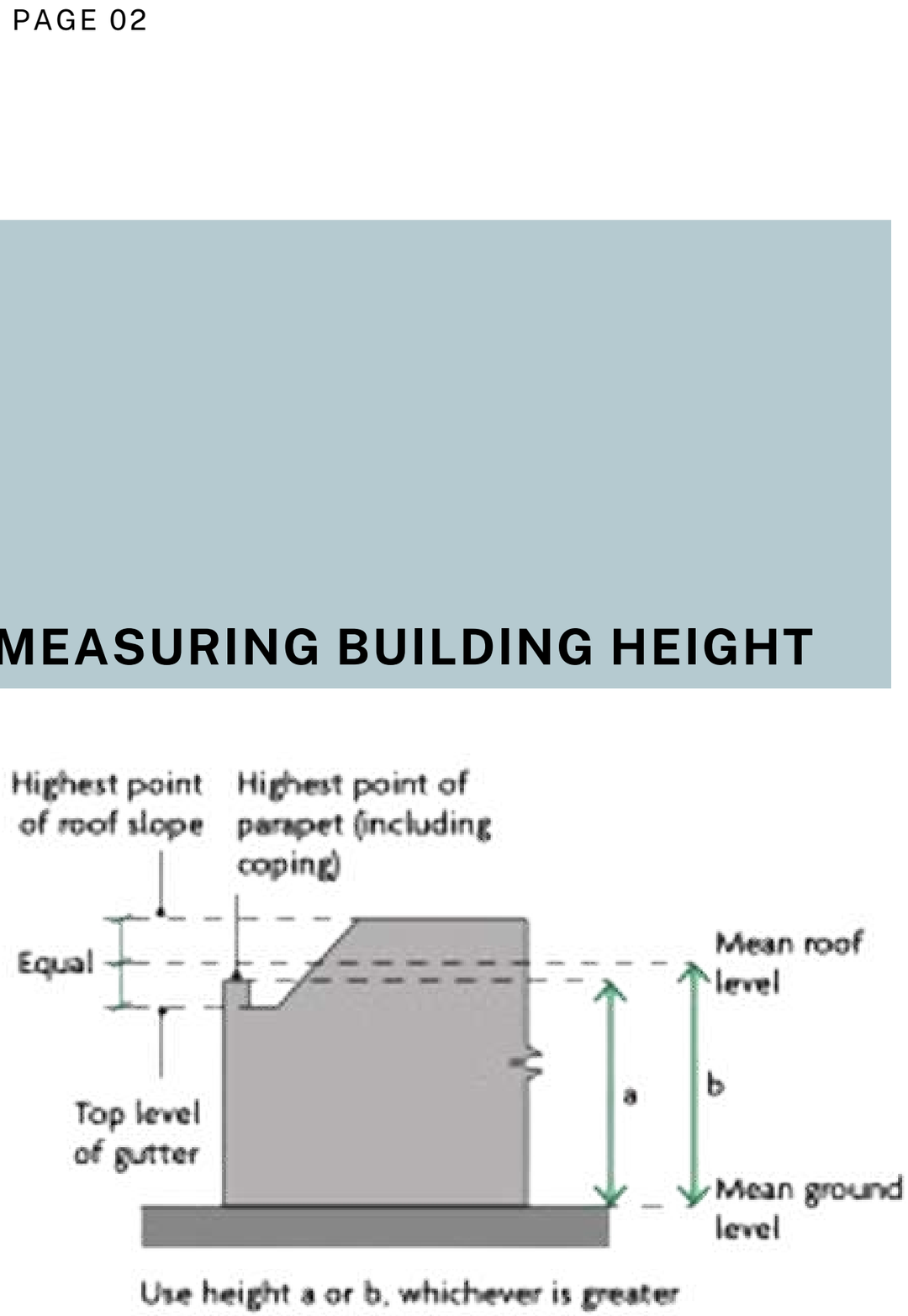
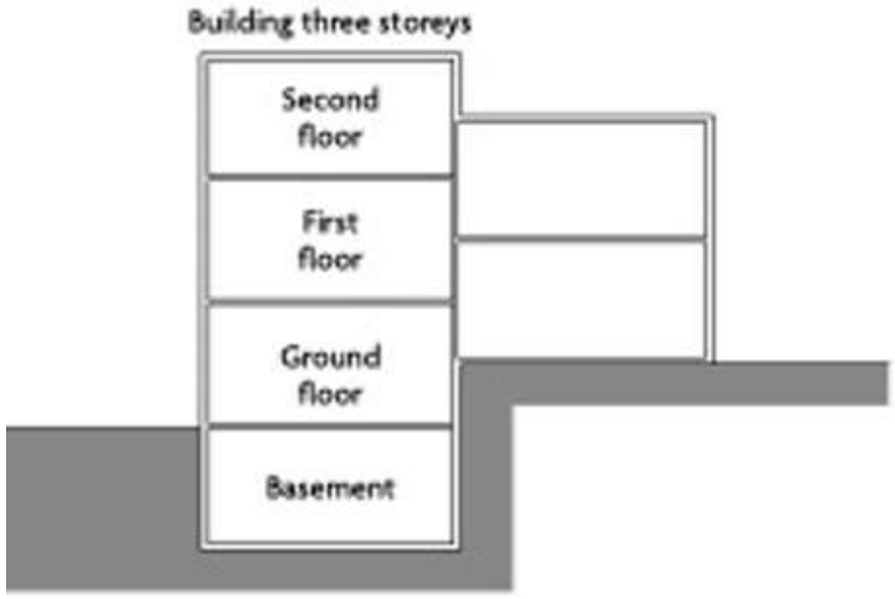


FIG. 1.1.1 HEIGHT OF BUILDING



To count the number of storeys in a building, or in a separated part of a building, count only at the position which gives the greatest number and exclude any basement storeys.

NOTES:

1. In assembly buildings (purpose group 5), a gallery is included as a storey, but not if it is a loading gal fly gallery, stage grid, lighting bridge, or any galler provided for similar purposes, or for maintenance repair.

2. In other purpose group buildings, galleries are not counted as a storey.

3. For the definition of basement, see Appendix A.

FIG. 1.1.2 NUMBER OF STOREYS

MEASURING BUILDING HEIGHT

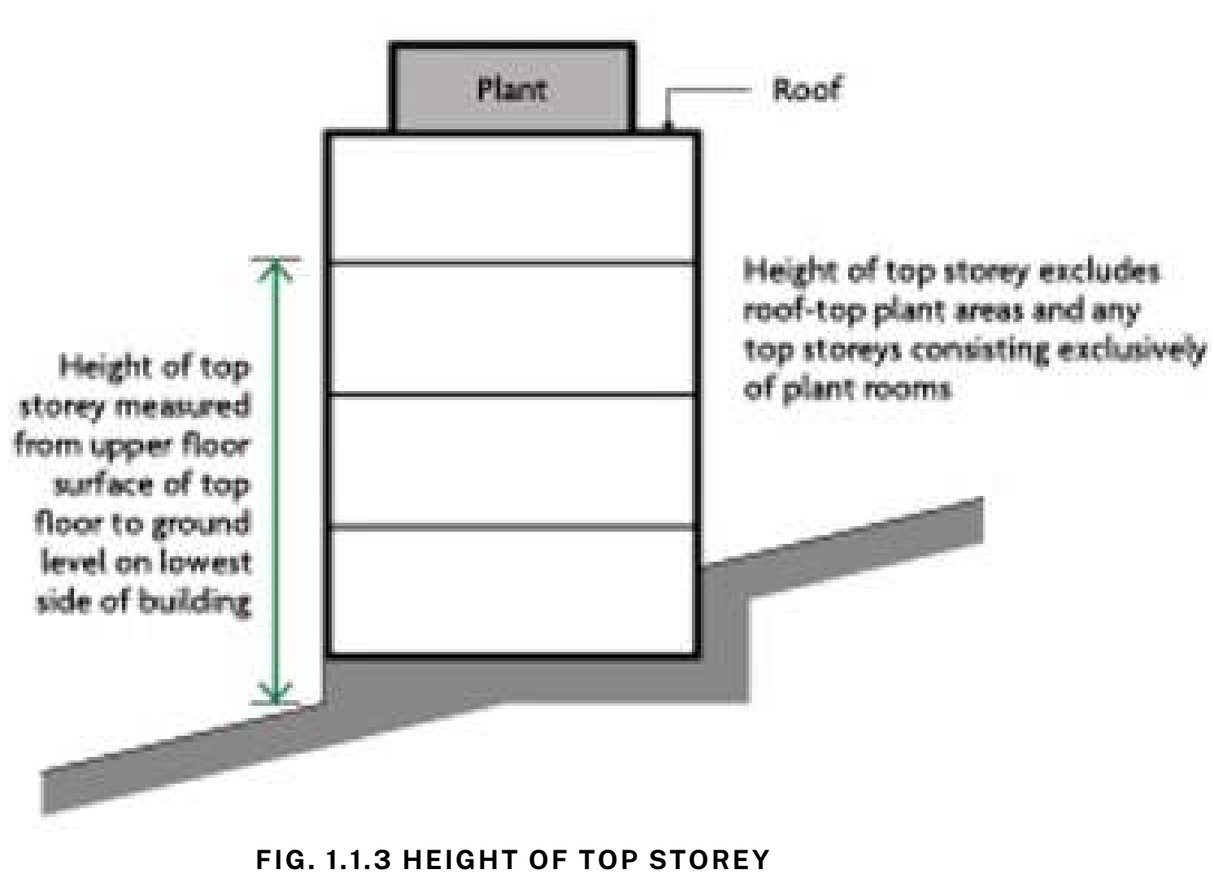


FIG. 1.1.3 HEIGHT OF TOP STOREY

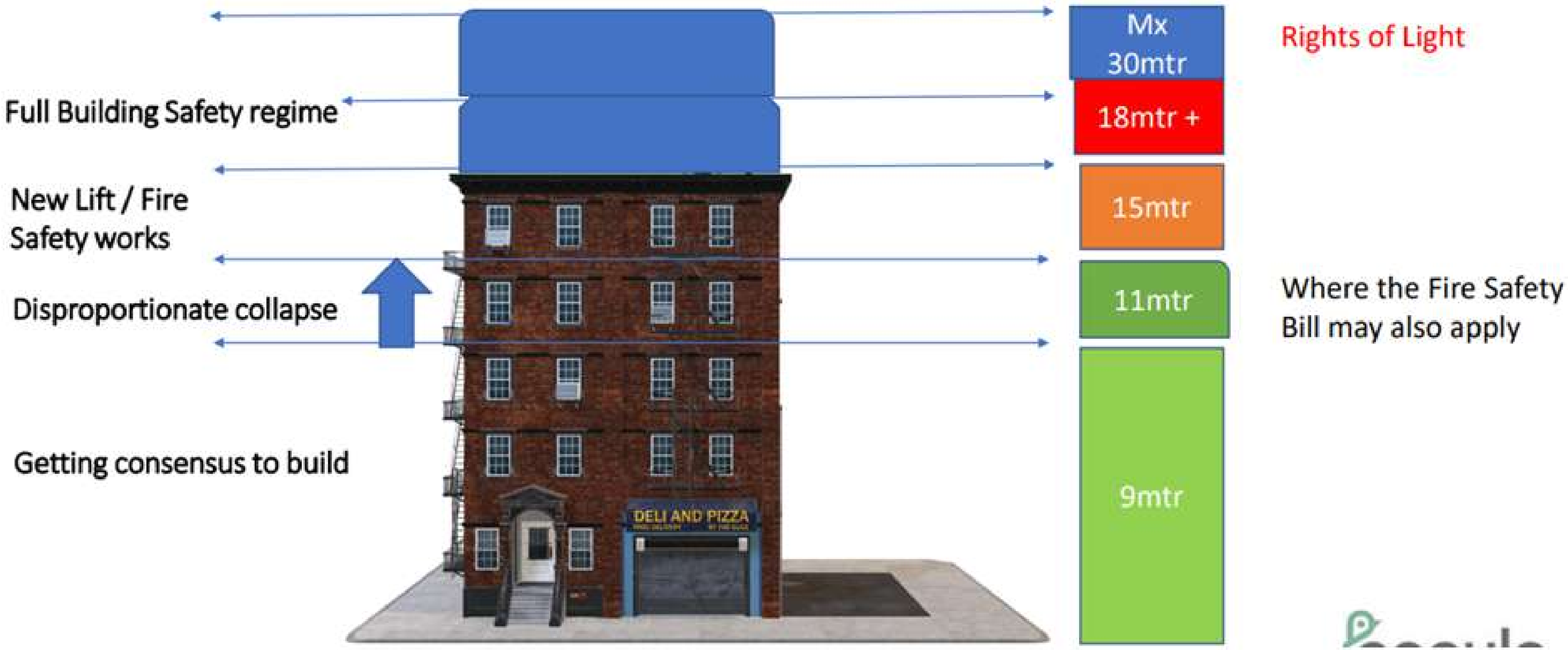


FIG 1.1.4 FIRE SAFETY REGULATIONS FOR BUILDINGS AT DIFFERENT HEIGHTS

Buildings above 11 meters:

- Buildings should be fitted with a sprinkler system throughout the building, within individual flats; they do not need to be provided in the common areas such as stairs, corridors or landings when these areas are fire sterile.

- Any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar) etc. used in the construction of an external wall should be class A2-s1, d0 or better.

- Way finding signage including floor identification signs and flat indicator signs should be provided for fire service.

- A Secure Information Box to give fire and rescue services access details in event of fire should be provided in the building.

Buildings Above 18 meters

- Incorporate an Evacuation Alert System to help fire and rescue services inform residents of a change in evacuation strategy, during an incident.
- The flights and landings of escape stairs should be constructed of materials achieving class A2-s3, d2 or better if the escape stair serves any storey that has a floor level more than 18m above ground or access level.

- Any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar) etc. used in the construction of an external wall should be class A2-s3, d2 or better.

- The building should have one or more firefighting shafts, each containing a firefighting lift.

- Firefighting shafts should serve all storeys through which they pass. In buildings where a firefighting shaft is required, a minimum of two firefighting shafts should be provided to buildings with a storey that has both, a floor area of 900m2 or more, or a floor level 18m or more above the fire and rescue service vehicle access level.

Provision of Firefighting Shafts

Buildings in which firefighting shafts should be provided, showing which storeys need to be served

a. Any building

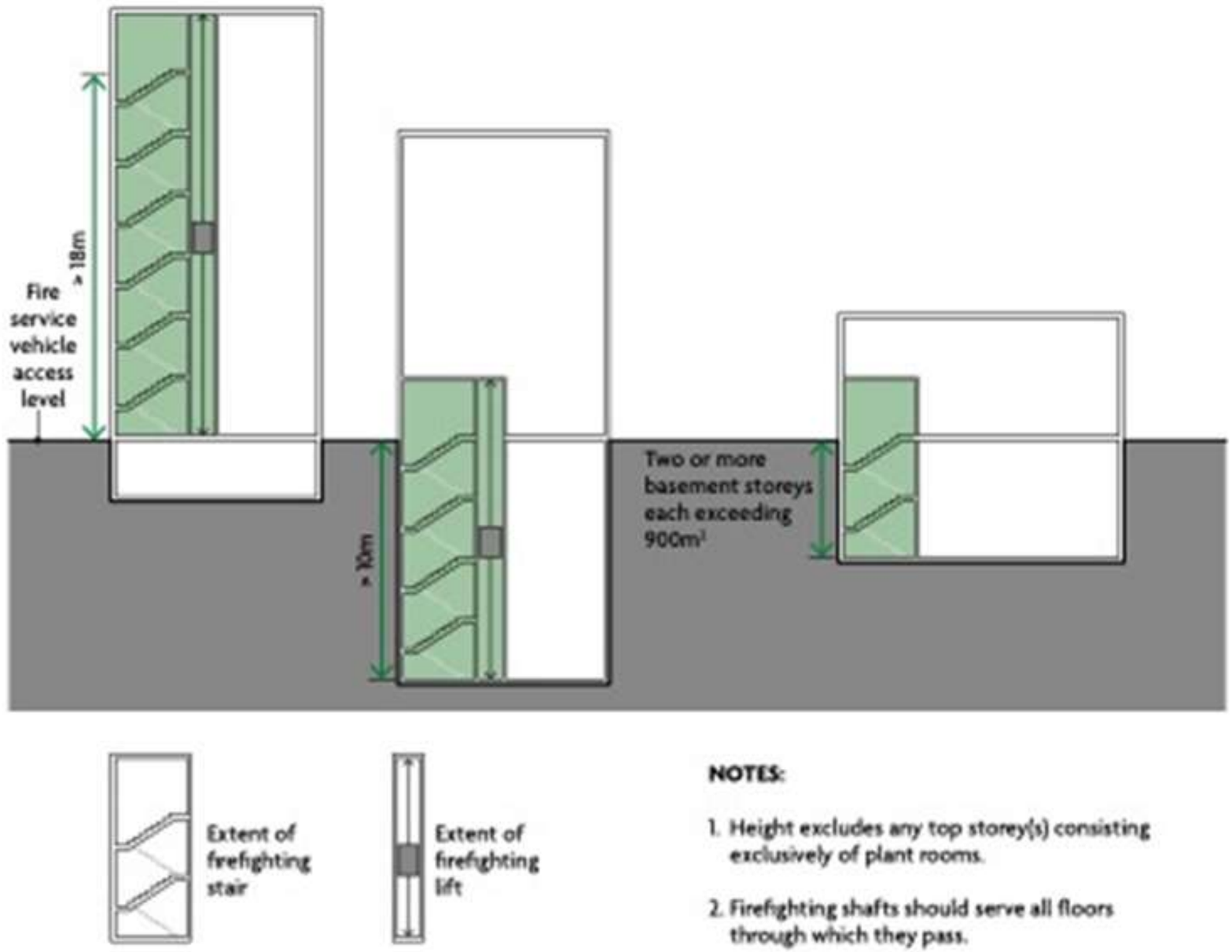
The upper storeys in any building with a storey more than 18m above fire service vehicle access level

b. Any building

The basement storeys in any building with a basement more than 10m below fire service vehicle access level

c. Any building

The basement storey(s) in any building with two or more basements each exceeding 900m²



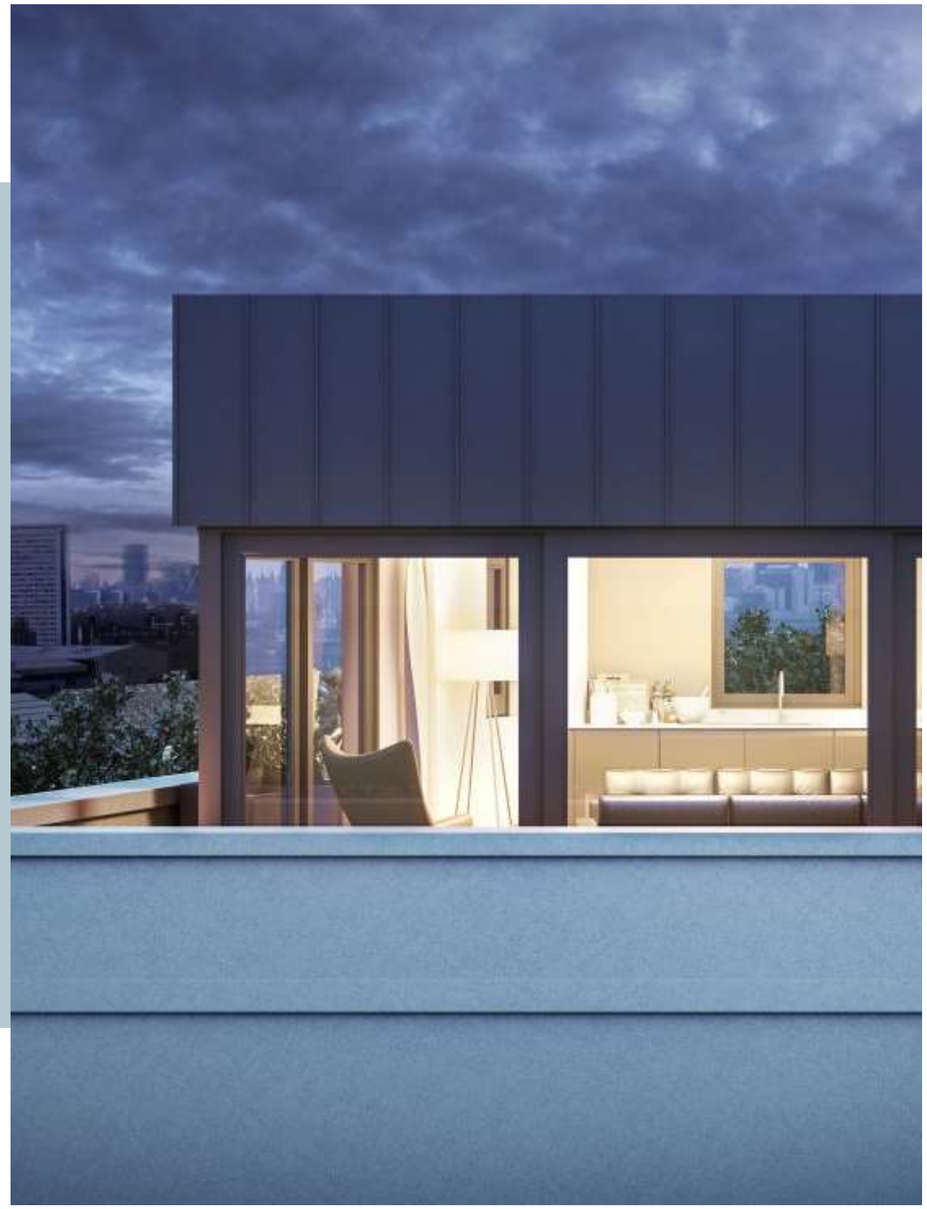
NOTES:

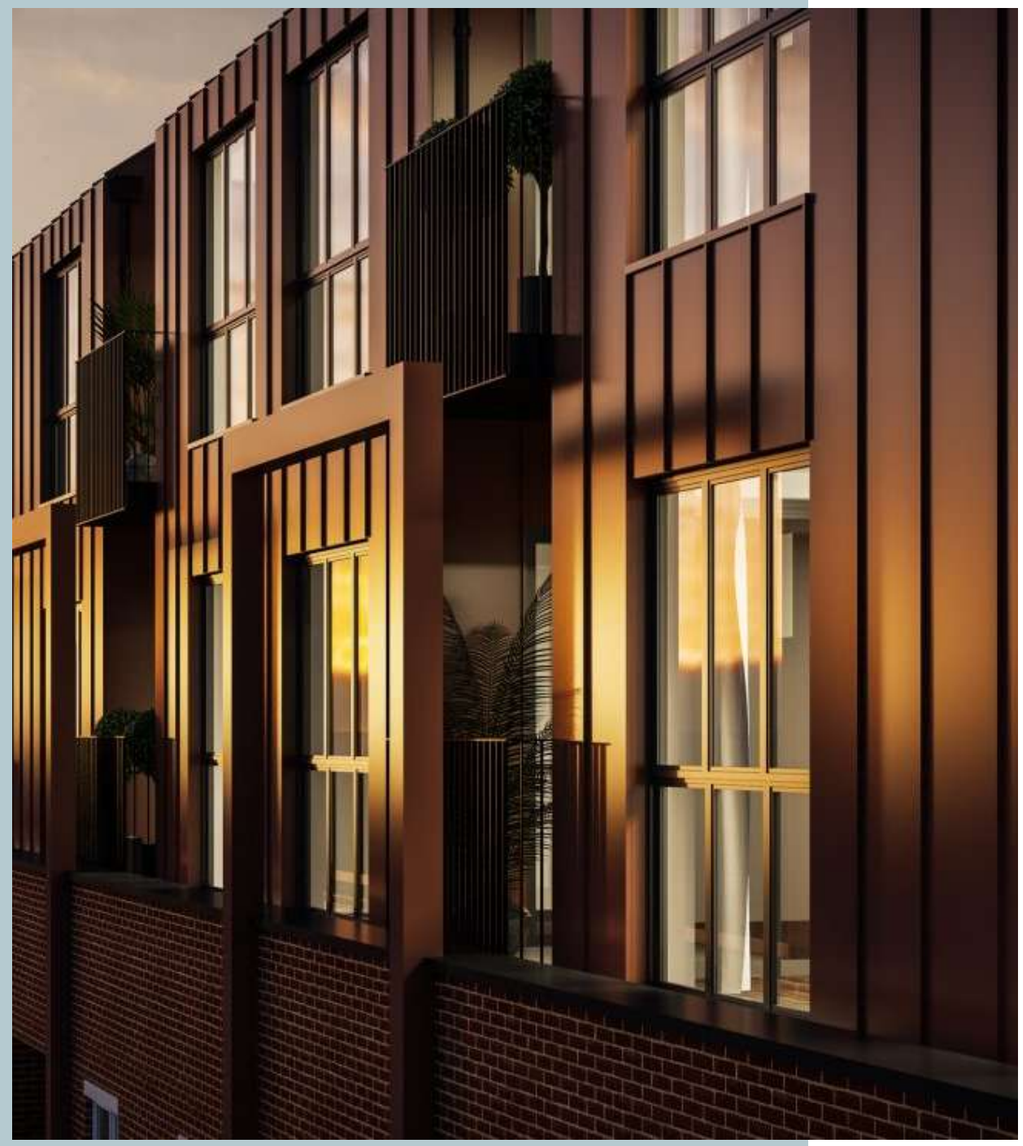
1. Height excludes any top storey(s) consisting exclusively of plant rooms.
2. Firefighting shafts should serve all floors through which they pass.

FIG.2 PROVISION OF FIREFIGHTING SHAFTS

FIRE SAFETY STRATEGY IN APEX AIRSPACE PROJECTS

Airspace Development-building in ‘air rights’ above existing buildings, requires special attention to fire safety regulations. Not only does the building height increase as a result, also the co-existence of new structure with the old one requires changes to the overall building fire strategy, particularly when the building exceeds threshold for changing requirements. Often, the building, because of its structure and age, cannot comply to updated regulations, requiring alternate strategies for compliance to be explored. Few of Apex projects and Fire Strategy adopted are discussed below.





NO. OF STOREYS: 06
HEIGHT: 15 METERS

(READ OUR CASE STUDY ‘AIRSPACE DEVELOPMENT CONSTRUCTION METHODS AND TECHNIQUES’, TO FIND DETAILS ON A&R HOUSE CONSTRUCTION TECHNIQUE)

ANTONY AND RODERICK HOUSE

Antony and Roderick are two residential apartment buildings located in Bermondsey. Both buildings contained four storeys (Ground and First – Third Floors) with residential accommodation approached via open balcony access at each floor level. Apex sought a design solution for combining the two existing occupied buildings using a central connecting core with lifts for access, and ‘bookends’ of maisonette apartments at either end. Airspace above the existing two buildings were used to form a double-storey rooftop extension for 30 additional homes. Volumetric modular offsite construction was used to build the units in a factory setting, and assemble them onsite, while removing pitched roof of the building onsite and developing a steel frame exoskeleton, to bear the load of the additional homes.

FIRE STRATEGY

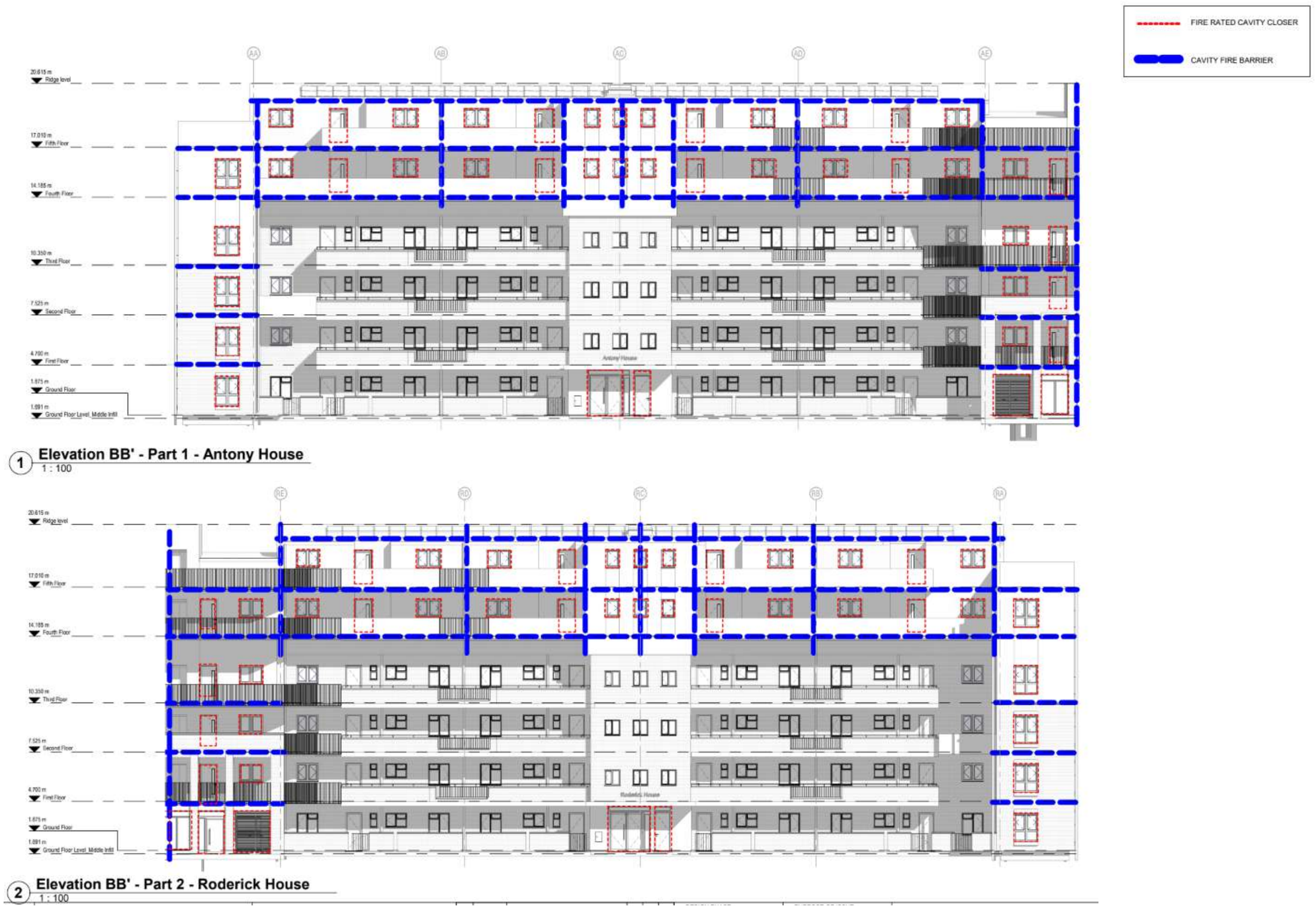
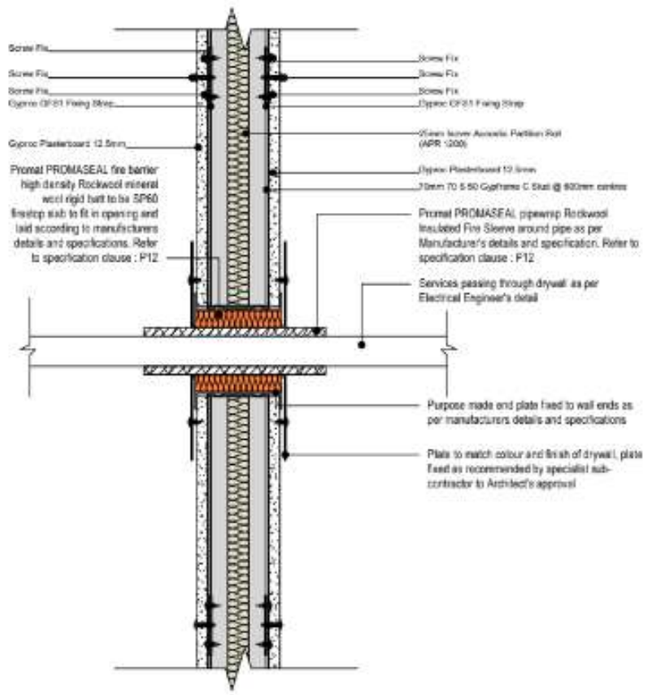
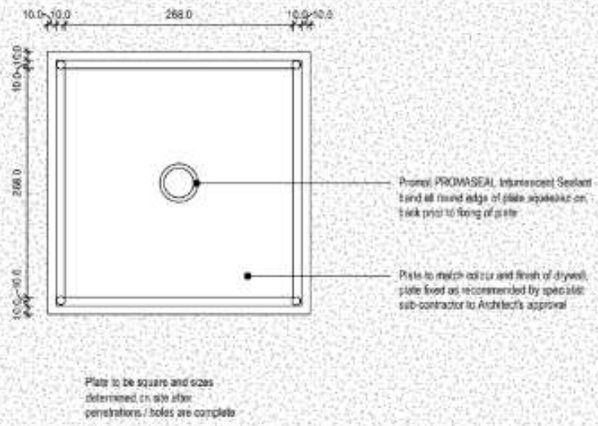


FIG.3.1 A&R HOUSE ELEVATION PLAN WITH FIREPROOFING DETAILS



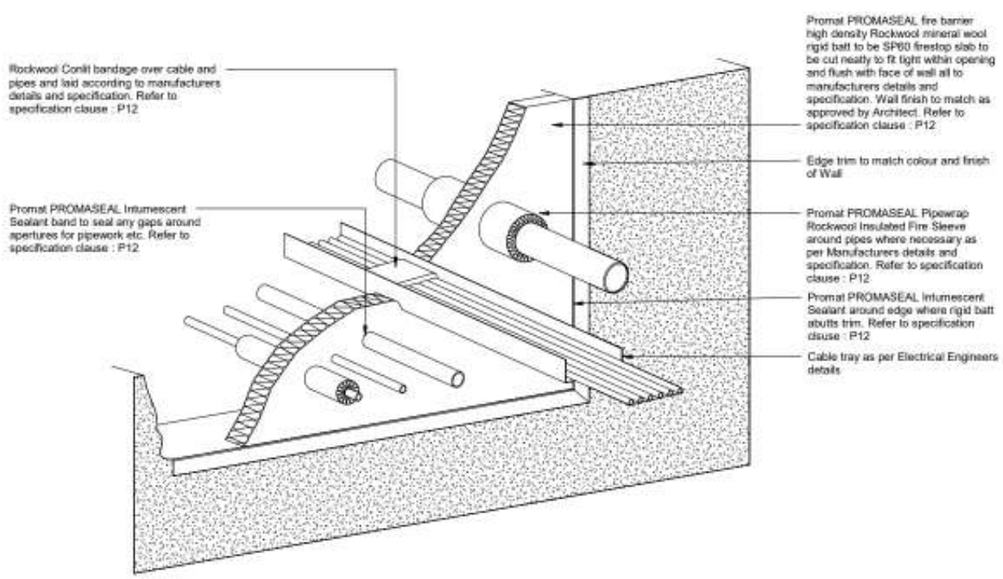


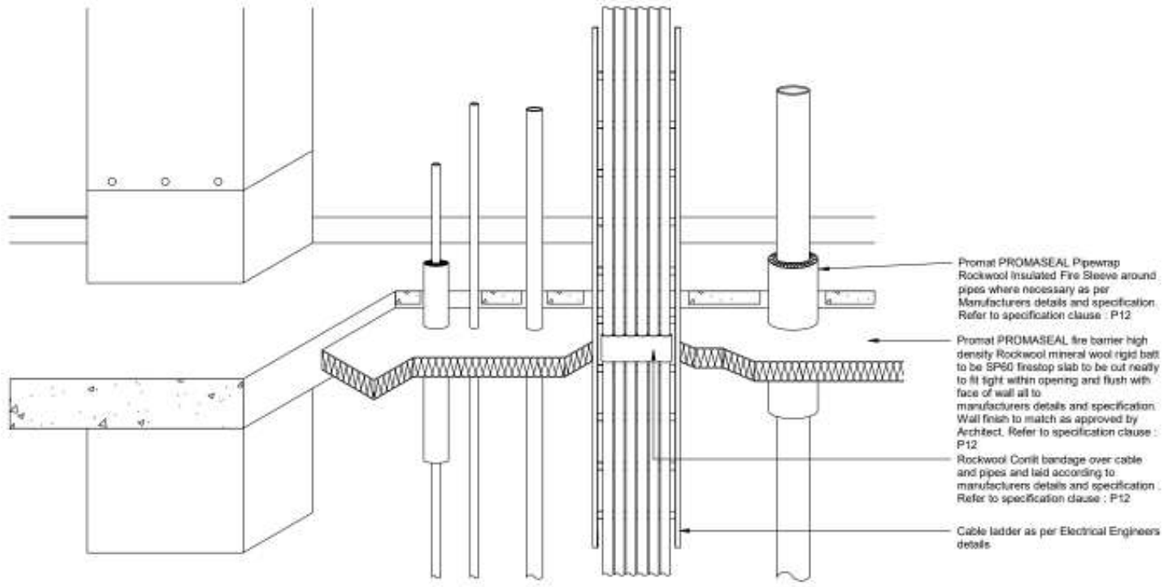
1 **Services penetration through a fire rated wall**
1 : 5
TYPICAL

2 **Services penetration through a fire rated wall - Elevation**
1 : 5
TYPICAL

FIG.3.2 VERTICAL FIREPROOFING/RISERS-A&R HOUSE

- The new apartments are provided with a protected internal hallway achieving 30 minutes fire resistance (with FD30 doors).
- All corridors are provided with Addressable Optical Smoke Detectors, with independent alarm systems.
- All apartments are provided with smoke detectors, with heat detectors provided in kitchen.
- All floors within the building designed as fire compartment floors, achieving 60-minutes fire resistance
- The building contains two means of escape stairs, however at the upper levels there are a number of apartments that are provided with a single direction of escape..





3 **Services penetration through a fire rated wall**
1 : 10 TYPICAL

FIG.3.2 VERTICAL FIREPROOFING/RISERS-A&R HOUSE

- Both means of escape stairs are provided with Openable Vents (OV) for the fire and rescue service to use from the top storey.
- External fire barriers are installed at pods at the rear side, on levels 4&5.
- Helping hand bar & rail are installed at level 4 and 5.
- Dry rising mains are provided in each core and near the entrance to ensure adequate hose coverage to all apartments.
- Firefighting staircases (shafts) and a fire fighting lift are provided. In accordance with BS9999 and the fire strategy, dual power supplies are provided to both the emergency lighting in the cores and the firefighting lift via a single intake and a standby generator.

NO. OF STOREYS-6
HEIGHT: 17.9 METERSS

(READ OUR CASE STUDY ‘AIRSPACE DEVELOPMENT-CONSTRUCTION METHODS AND TECHNIQUES’, TO FIND DETAILS ON MARION COURT CONSTRUCTION TECHNIQUE)

MARION COURT

Marion Court is a five-storey residential development, built in the 1920s, with a commercial unit on the ground floor. Apex designed and built four penthouses by adding another floor to the existing building. The additional storey was constructed using light-gauge steel frame, raising the height of the building to incorporate chimneys into design.

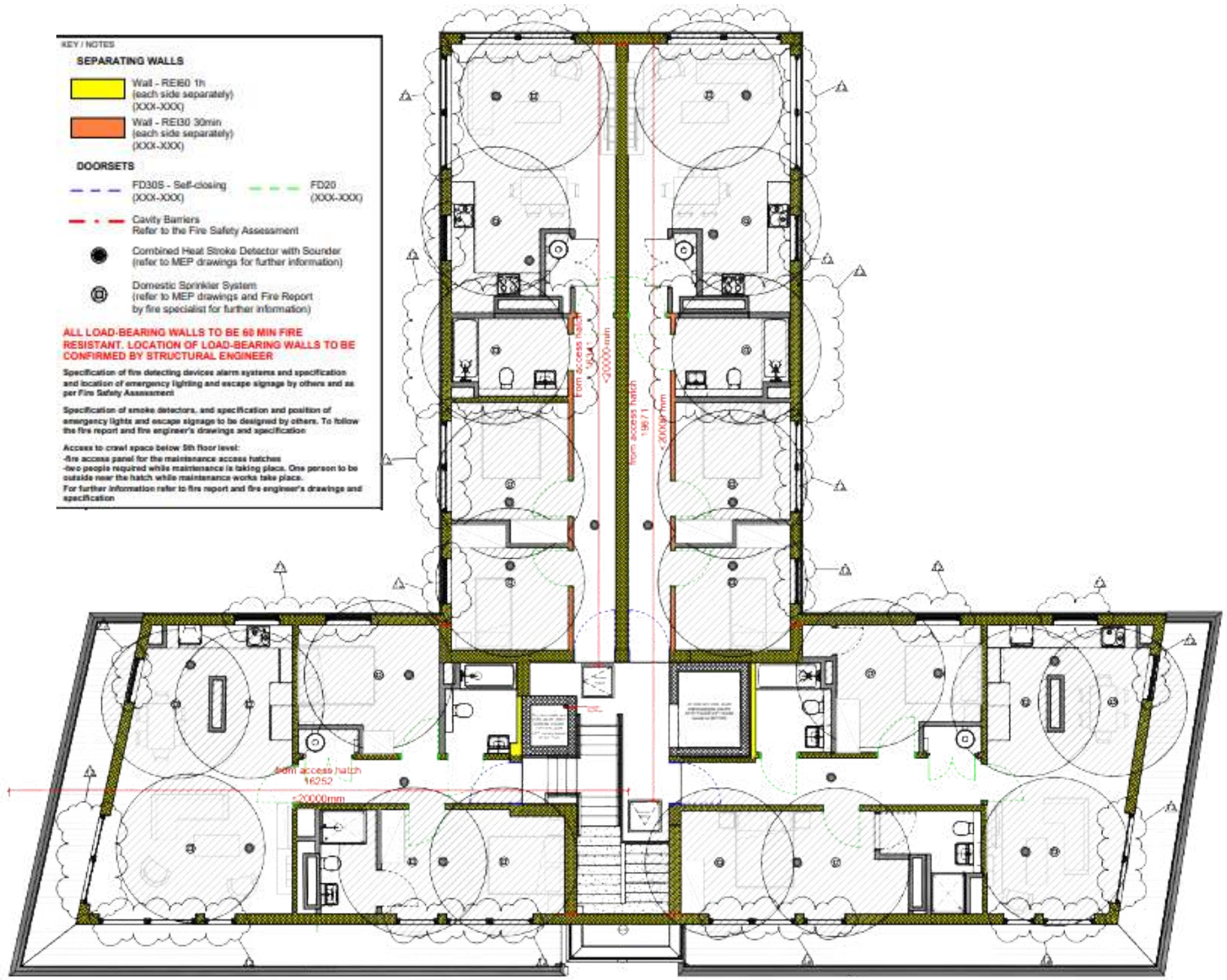


FIG.4.1 MARION COURT-FIRE STRATEGY FIFTH FLOOR PLAN

FIRE STRATEGY

- Fire Strategy for Marion Court is designed as a ‘Stay Put’ Policy whereby only an apartment that has a fire should evacuate and the remainder of the residents should remain in occupation, unless advised by the fire brigade to evacuate when they arrive.
- Each flat has been provided with a heat detector in the kitchen and smoke detectors throughout the property, all mounted on the ceiling.
- The communal staircase has an independent fire alarm system linked to all floors, the front entrance door and the roof mounted smoke vent.
- Each apartment is protected by a ceiling mounted sprinkler system, which in the event of a fire, the heads will be activated by heat and douse the property with water to extinguish any fires. The sprinkler system is served by a sprinkler tank located on the landing on the 5th floor.

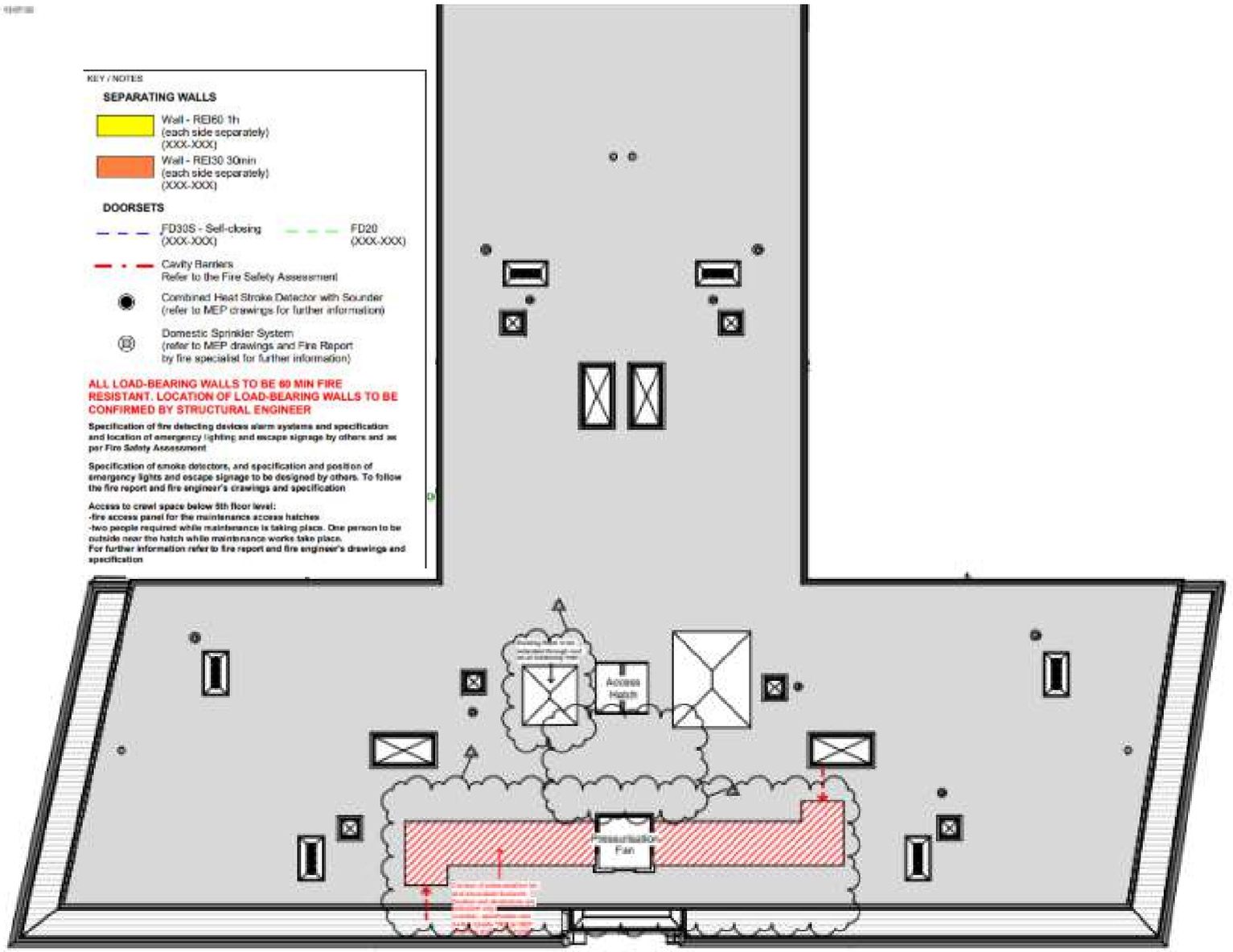


FIG.4.2 MARION COURT -FIRE STRATEGY ROOF PLAN

- The balconies have been constructed using fully non-combustible materials. The decking is an Anthracite grey aluminum Duradeck A1 rated, with powder coated balustrading.
- The external cladding is also a Dura aluminum material and is A1 fire rated.
- Owing to building design and age, provision of smoke shaft in the protected corridor was not possible. As a counter strategy, a dry riser is included within the building, providing
- the fire and rescue service with the facilities to fight a fire occurring on any of the floors of the building.

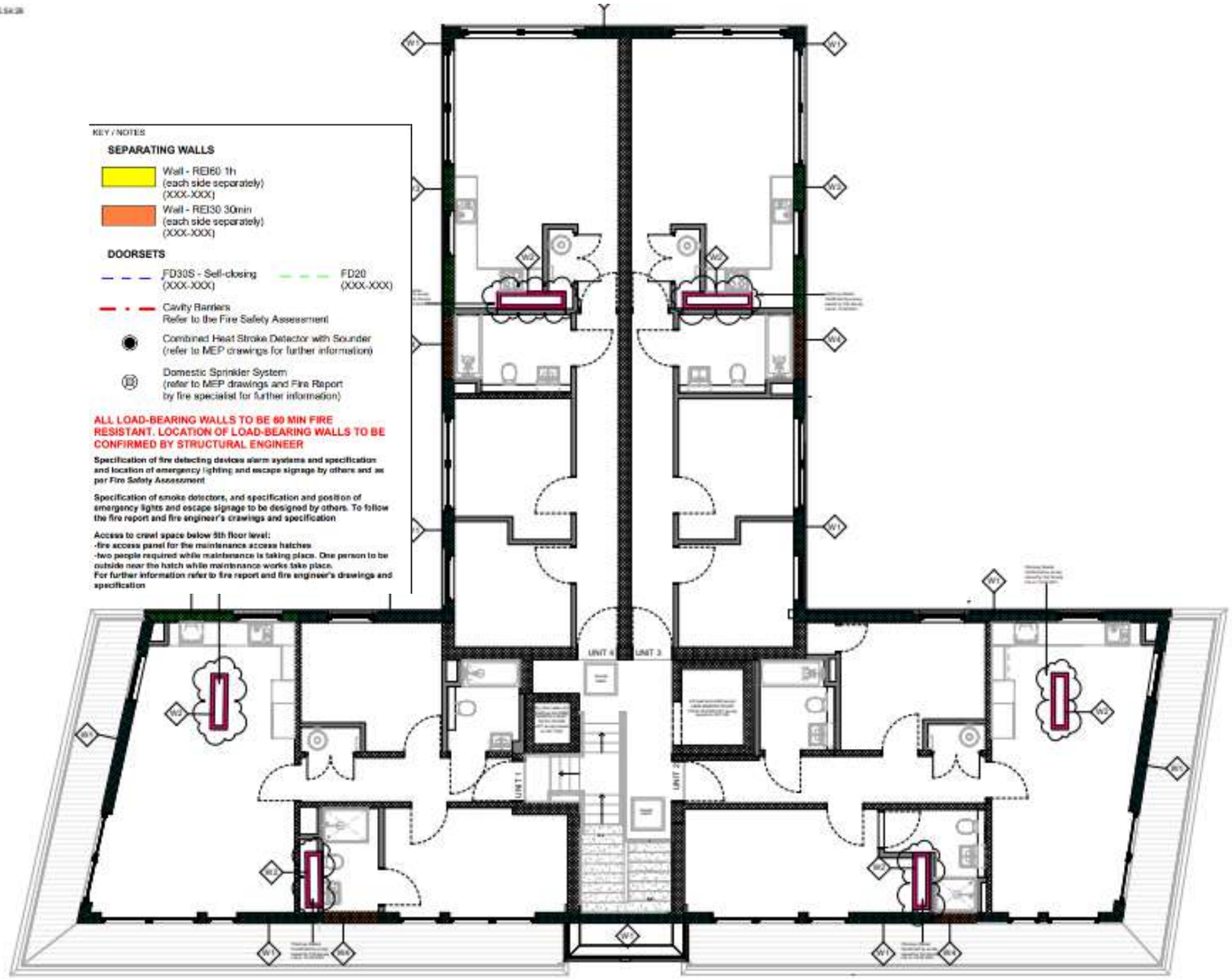


FIG. 4.3 MARION COURT-EXTERNAL WALLS FIFTH FLOOR PLAN

- Additionally, an AOV is introduced at the head of the communal stair area which will be operable remotely at the fire and rescue service access level.
- Although the existing ground to 4th floors do not comply with current regulations, the addition of an AOV and dry riser offers an enhancement on the current layout of the lower floors.
- A mechanical extraction system is introduced on the 5th floor. In the event of a fire within any of the flats on the 5th floor, the mechanical ventilation will extract the smoke, preventing the protected stairwell from becoming smoke logged.

Read Next: Determining ‘Void Gap’ in Airspace Projects