



Fire Safety Strategy
for
Castle Yard

December 2021





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DEFINITIONS

The following definitions apply:

Personnel

Employer:	Peveril Securities Ltd
Employer's Representative:	Exton Estates Ltd
Contractor:	TBC
Structural Engineer	Reuby & Stagg
M&E Engineer	Watkins Payne
Architect	Dn-a
Landscape Architect	Turkington Martin
Approved Inspector	Stroma

Shell Core and Cat A Works

1.0 GENERAL

This document is to be read in conjunction with the proposed planning documents ref: 21-P0373-PREAPP

1.1 Instruction

A collaboration between dn-a (Architects) and Stroma (Building Control) have been appointed to carry out a desktop review of the fire safety strategy for 1 Castle Yard Building, Richmond. TW10 6TF

This document forms a general principled approach for fire matters and where the design team will ensure the contents of this report are incorporated in the building. This approach will not prevent a fire occurring, but the Responsible Person must ensure good housekeeping and fire management to be encouraged to reduce fire risk. This fire strategy is mainly concerned with getting occupants out of the building safely and providing measures, where necessary, to assist the fire fighters in their operations.

1.1 The Works

The existing building is three storeys. The ground floor is a 350mm thick load bearing slab with nominal reinforcement. The First and Second Floor super structure are composed of concrete "clay pot" floor construction spanning onto solid concrete beam strips. The walls to the lift shaft, stairwell and service riser and RC Concrete form the main core of the building providing stability. The perimeter walls are formed from RC concrete column/wall strips with voids for the glazing between. There is a continuous floor RC edge beam to the perimeter. Over the entrance there is a solid concrete floor section which cantilevers out. The current roof is part solid concrete slab catering for the plant space (and over the core area) and a lightweight roof on steelwork to all other areas. The existing roof (including all structures above) is to be removed in its entirety leaving the Second floor perimeter columns, internal columns and core walls exposed.

The proposed works require the delivery of a high quality office building, comprising of the following:

Internal renovation and reconfiguration of the existing building, external material changes, two storey roof addition with terraces and plant enclosure to accommodate 744sqm of additional commercial floorspace.

The office building will provide 21,664 sq ft (net internal) office space; 25,618 sq ft (gross internal) including entrance and circulation areas.

The works will include the complete internal strip out back to shell and core, and the complete removal of the existing roof level and plant zone allowing for a new third and fourth floor extension with a new roof level and plant enclosure. New roof finishes including an accessible roof for maintenance only and perimeter recesses.

The proposed new superstructure onto the Second Floor columns a new floor is to be constructed of hot rolled steel beams with cold rolled steel joists lined with a ply boarding. The underside of the steel beams and joists is to receive 2 layers of boarding to provide the required fire/acoustic resistance. The new third floor structure is to cantilever out at the feature bay windows and provide support to the curtain walling system adopted.

Above the Third floor steelwork floor beams, new 4th floor steel columns are to be positioned aligned to the existing internal and perimeter columns below.

The new 4th Floor is formed from hot rolled steel beams with cold rolled steel joists lined with a ply boarding. The underside of the steel beams and joists is to receive 2 layers of boarding to provide the required fire/acoustic resistance. The Fourth floor structure contains a cantilevering edge to tie the top of the curtain walling back and provide a flat roof ledge to 3 sides of the building.

The new lightweight Roof formed from hot rolled steel beams with cold rolled steel joists lined with a ply boarding. The underside of the steel beams and joists is to receive 2 layers of boarding to provide the required fire/acoustic resistance.

The new plant area is to have raised thermally isolated steel decks for specific large plant pieces formed in steelwork. Other sections of mounted plant to be on thermally isolated raised steel mounting decks. Number and positions to be based on M & E requirements.

The top floor will consist of high quality IGU windows incorporated with PPC aluminium panels and louvred overhead panels, new roof plant is to be screened with new roof plant screen system.

Floors 1-3 will have new curtain wall bay systems incorporated with louvred overhead panels to replace the current glazed bays. New cooling and heating systems will be based on large quantities of fresh air drawn through façade louvres and integrated decorative façade panels. The new bay windows will be openable.

The ground floor will be new high quality IGU windows. The main entrance will be remodelled with ramp approach to meet BS8300 requirements.

All the existing brick façade is to be retained and made good to receive new painted finish. The existing perimeter walls are RC concrete column wall strips with minimal cavity voids and traditional brickwork construction. No insulation is required to the upgrade of the existing floors construction.

New decorative brick panels constructed of traditional brick will be incorporated at the ground floor level below the window systems.

A new proprietary brick slip cladding system will be installed at the new 3rd floor level. The system will comprise of brick cladding with a SFS (structural framing system) thermal and waterproof backing incorporating Euroclass A1 non-combustible Rockwool Rainscreen duo slab insulation with cavity barriers located at each floor and zoned façade compartmentation to eliminate external fire spread across the façade.

A new proprietary metal rainscreen system will be installed at the new 4th floor level. The rain screen system comprised of PPC metal profile with a SFS (structural framing system) thermal and waterproof backing incorporating Euroclass A1 non-combustible Rockwool Rainscreen duo slab insulation with cavity barriers located at each floor and zoned façade compartmentation to eliminate external fire spread across the façade.

The existing building concrete frame will be adapted and/or reinforced where required.

The new freestanding staircase (protected external wall, not internal) will be formed on new RC concrete pad foundations with steel full height columns and hot rolled steel framing at every floor level. The staircase is to be tied back into the existing structure at every floor level. Stringers formed in steel plate, with inset tray treads. Side walls to be formed in SFS studwork over boarded to a metal rainscreen system.

The floorplans are organised around a single central core with reception approach at ground floor. The core will provide the required riser services, landlords lift, WC, executive shower rooms and locker provision.

Each floor plate of the office building will have a kitchenette provision and be capable of subdivision to form 2 separate tenancy zones to allow the building to be let to multiple occupants.

The works will include new hard landscaping paving, car parking and lighting within the proposed site area. New semi mature trees are proposed around the building pavement perimeter by agreement with the local highways authority.

1.2 Statutory Approvals

The works as constructed are to comply in all respects and in accordance with all current regulations including Building Regulations 2010 as amended, applicable EC Regulations and Directives, HSE rules, all relevant current British Standards and Codes of Practice, and all relevant necessary approvals, suppliers / manufacturers' and subcontractors / installers literature and recommendations, Agreement certificates, recommendations of appropriate trade bodies, together with the current recommendations of the Fire Officer and the Public Health Officer and take cognisance of the Equality Act 2010 insofar as it affects the design and use of the building, good practice and any other applicable standards, codes or guidance.

The works will be designed and specified in accordance with the requirements of all the relevant Statutory Local Authority.

The mechanical, electrical and drainage services will be designed and installed in accordance with the relevant British Standards and Codes of Practice, the requirements of the Statutory Authorities, CIBSE Guide to Current Practice and the IEE Regulations.

The works shall be designed and constructed in accordance with the planning approval Richmond Council application no. 21-P0373-PREAPP. The contractor is responsible for fulfilling all their planning requirements including providing production of information as necessary to support the discharge of conditions, any highways agreements and payments including s.278 agreements, licences etc

The contractor shall comply with all CDM requirements.

The fire safety strategy for a building has been set early in the project to enable the design to comply (Fire Strategy Document).

1.3 Design Criteria

The following design occupancies based on Net Internal Area shall be taken into account in the design:

For means of escape provision	6 m ² per person
For air conditioning provision	8 m ² per person
For sanitary provision	8 m ² per person
For lift provision	10 m ² per person

(The design of the lift system is based on a population density of 1 person / 12m² (net internal area, NIA); this reflects a workplace density of 1 person per 10m² with a utilisation of just over 80% (BCO criteria).

1.7 Accessibility

The building will comply with Building Regulations requirements in respect of access, means of escape, lifts and sanitary provision and take cognisance of the Equality Act insofar as it affects the design and use of the buildings. Showers and disabled toilets/showers shall be provided in accordance with relevant legislation and Building Regulations. Disabled refuge points will be provided in accordance with Building Regulations 2010 as amended and the relevant codes of practice BS5839.

1.8 Means of Escape

- a) Means of Escape will be formulated within a fire strategy and subject to approval by the Building Control Officer and Local Authority Fire Officer requirements or the recommendations of BS 9999:2017. Where the building is let on the basis of multi occupancy, means of escape would remain in the landlord's demise.
- b) The main staircases and lobbies to be protected in line with the fire safety strategy. As outlined in the fire strategy, by the approved fire consultant on this project.
- c) Means of escape will provide access via the main central core staircase used as primary egress provision. The building is also serviced by a secondary stair escape.
- d) All travel distances are in accordance with BS 9999.
- e) An automatic fire smoke detection and alarm system provided in accordance with BS 5839.
- f) Emergency lighting in accordance with BS 5266 to all escape routes and the required accommodation.

1.9 Building Materials

- a) The developments intention is to provide materials and components that are classified euro class A1, A2 s1d0 where possible.
- b) The developments intention is to provide materials and workmanship in accordance with regulation 7 albeit the building is less than 18m. This may not be possible where filters are required to draw in fresh air through the façade vents in the external envelope to upgrade the building services.
- c) The development intention is for membranes used as part of the external wall construction above ground level that should achieve a minimum of class B-s3, d0.
 - No PIR or PUR in composite panels.
 - No polystyrene PIR or PUR insulation.
 - Rockwool / stonewool insulation favoured.
 - No aluminum, zinc or other metal composite materials (ACM's, ZCM's, etc)
 - No timber or composite timber cladding or decking, high pressure laminates (HPL panels), resin boards.
- d) Only particle board which conforms to all relevant British and European Standards may be used in the building.
- e) Only medium density fibreboard which conforms to all relevant British and European Standards may be used in the building.
- f) Workmanship shall be to the highest standard and compliant in all respects with British Standards and all other guides and recommendations as referred to in Section 2.0.
- g) The Contractor shall permit, advise, arrange and attend upon the off-site inspection of the manufacture, fabrication, testing and completion of all key building components and obtain such facility from Subcontractors and suppliers. The Contractor shall generally give a minimum of seven days' notice to the Employer of his intention to carry out off site testing or commissioning of any part of the works.
- h) When requested the Contractor shall provide for the opening up for inspection and the carrying out of such tests as are stated elsewhere in this General Building Specification and also such as are, in the opinion of the Employer, reasonably necessary to demonstrate that materials and workmanship are in accordance with this General Building Specification, or the requirements of Building Regulations 2010 as amended, codes of practice, manufacturers recommendations, or The Building Contract.
- i) The Contractor shall provide all necessary information, test data, reports and certificates (including concrete test/quality control results) carry out tests (in laboratories acceptable to the Employer where applicable) and arrange demonstrations, as necessary to satisfy the Employer with regard to any material component or equipment which is proposed for incorporation in the Works.

- j) All materials are to be selected in accordance with “Good Practice in the Selection of Construction Materials, BCO, 2021”.

1.10 Unacceptable Materials

The following materials will not be used in the construction of the works:

- a) Crocidolite, vermiculite, any other asbestos, or products containing asbestos as defined in the control of Asbestos Regulations 2012 or any statutory modifications or re-enactment thereof.
- b) Polyisocyanurate or polyurethane foam unless manufactured without the use of CFCs/HCFs. Foam insulation manufactured using CFCs/HCFs, other than in LPC composite panels (see 1.4(a) above).
- c) Urea formaldehyde foam, or materials that may release formaldehyde in quantities in excess of the limit set by the Health & Safety Executive.
- d) Materials which are comprised of mineral fibres whether man made or naturally occurring which have a diameter of 3 microns or less, and/or a length of 200 microns or less or which contain any fibres not sealed or otherwise stabilised to ensure that fibre migration is prevented. For clarification interpretation of this clause will not preclude the use of Rockwool insulation products.
- e) All paints and primers are to be free from added lead and no calcium plumbate or red lead primers will be used.
- f) Lead or any materials containing lead which may be ingested inhaled or absorbed except where copper alloy fittings containing lead are specifically required in drinking water pipework by any relevant statutory requirements or lead in linseed oil putty and fittings for copper pipe in plumbing systems.
- g) Bitumen coated polythene as a damp-proof course.
- h) Any product which contains Montreal-listed CFC gases or uses them in manufacturing.
- i) Polychlorinated Biphenyls. (PCB`s)
- j) Mercury containing compact fluorescent lamps. (CFL`s)
- k) Volatile organic compounds (VOC`s), found in paint and protective coatings. Water based paints (emulsion, eggshell or gloss) have a low rating with acceptable tolerances up to 7.99%.
- l) Reynobond PE cladding panels.
- m) Any other recently identified deleterious or combustible product / building material that has been condemned, identified as failing safety tests or withdrawn as a result of the Grenfell Tower incident.
- n) Other substances generally known to be deleterious at the time of use including but without limitation substances referred to as being hazardous to health and safety in “ Investigating Hazardous and Deleterious Materials” edited by T Rushton, RICS Books, 2006 according to the then current edition.
- o) Any substance not in accordance with British Standards or Codes of Practice and all applicable legislation current at the date of construction.

2.0 UNOBSTRUCTED OUTSIDE SPACE

2.1 Fire appliances

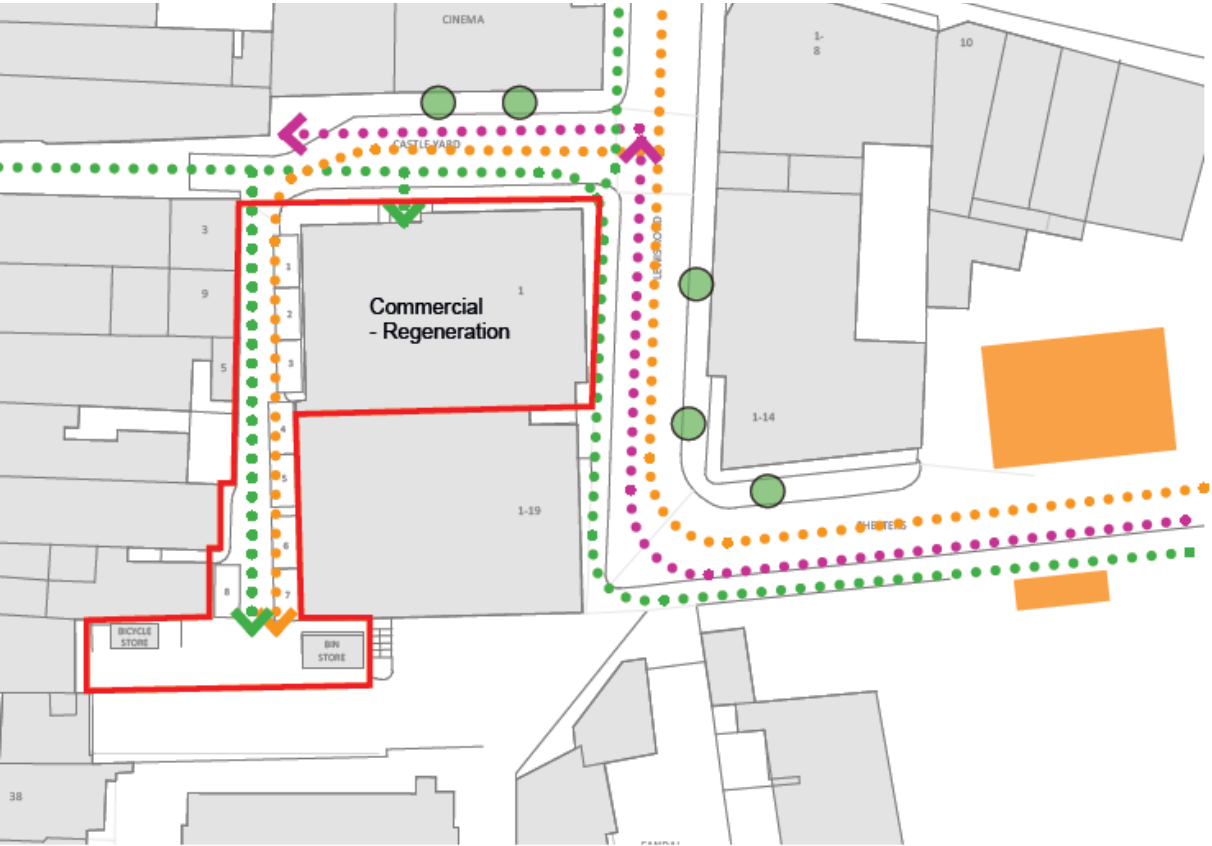
The fire service vehicle access to the perimeter is in accordance with the building regulations guidance.

An addressable fire safety panel within the entrance lobby will be provided for the fire services personal to identify the location of fire incident.

Sufficient unobstructed outside space is available for the Fire and Rescue Service at the front of the building on Castle Yard and the associated pavement surround. In an emergency, there is adequate space for a fire engine to

park outside the front of the building on Castle Yard or on the East side of the building on Lewis Road, either of these two locations providing access to 50 percent of the building perimeter.

Site plan



- Key:
- Site Boundary
 - Main Vehicular Access
 - Pedestrian and Bicycle Access
 - Emergency Access
 - Bus Stop/Station

2.2 Evacuation assembly point

The Mews car park will be utilised as an evacuation assembly point. Occupants of the building will be made aware of this upon signing their contract.

Assembly points should not get in the way of access for the Fire and Rescue Service.

Assembly points should not be at risk from breaking glass falling from windows of the building façade.

Final exits will be sited to ensure rapid dispersal of persons from the vicinity of the building so that they are no longer in danger from fire and smoke. Direct access to a street, passageway, walkway or open space will be available. The route clear of the building should be well defined and, if necessary, have suitable guarding.

Final exits will not present an obstacle to wheelchair users and other people with disabilities. Where a final exit is accessed without the need to first traverse steps then a level threshold and, where necessary, a ramp will be provided.

Final exits will be apparent to persons who may need to use them.

A management system will be in place for persons requiring assistance.

3.0 FEATURES FOR REDUCTION OF RISK TO LIFE AND SERIOUS INJURY IN EVENT OF FIRE

The new building proposed on this site will be modern in nature and will comply with appropriate building regulation standards. Measures will be incorporated into the scheme to reduce the risk to life and serious injury in the event of a fire including the inclusion of smoke alarms and fire extinguishers and emergency lighting. A fire alarm To BS 5839 Part 1 Category L2 will be provided. All fire exits and means of escape will be clearly marked. Fire door sets which require held opening devices are to be interconnected to the FDAS, so to provide a signal to release and close the fire door sets into the frames.

The building is less than 18m. The building is to be construction of fire compartment floors. Each floor and zoned façade compartmentation shall be designed to eliminate the spread of fire and contain.

Further compartmentation can be provided in future if the floor plates are sub-divided.

A sprinkler suppression system is not to be installed as part of building.

The building is designed as a multi stair building with egress provided to both staircases.

Refer to commentary on external wall build ups section 1.1 above.

Fire door assembly will be procured and installed in accordance with the appropriate fire test certification.

Service penetrations will be fitted with the appropriate fire dampers and fire stopping.

An evacuation lift shall be provided with primary and secondary back up power supplies. An appropriate cause and effect matrix will be provided.

4.0 CONSTRUCTION TO MINIMISE THE RISK OF FIRE

The building will be designed to satisfy the contemporary version of the Building Regulations Part:B for fire safety. This will incorporate safe measures for fire detection, means of warning occupants, means of escape, means of control of a fire.

Refer to commentary on retaining the existing concrete frame section 1.1 above.

Refer to commentary on the limited combustible materials section 1.1 / 1.9 / 1.10 above.

Refer to cores and fire compartmentation section 3.0 above.

The construction will provide 60mins fire resistance to the structural elements.

5.0 MEANS OF ESCAPE AND AN ASSOCIATED EVACUATION STRATEGY

There will be an evacuation strategy clearly positioned in the office space as well as in the common parts of the at each level. The means of escape will be clearly signposted and will be via the stairwell or evacuation lift which can be safely used in case of an emergency.

The evacuation plan will not rely on the assistance of the fire and rescue service. This is an important factor, which will be taken into account at all times during the building's occupation.

The evacuation of disabled occupants plays an important role in the overall evacuation of the building.

The proposed layouts indicate suitable disabled refuge points located within protected lobbies or stairwells for occupants to be able to safely remain for the Fire and Rescue Service. Suitable signs will also be provided for each refuge point.

The responsible person should advise persons formally of the fire safety arrangements for the building, what to do to prevent fires occurring, and what to do in the event of a fire. This information will be readily available as a wall mounted evacuation plan, which will also address the potential for particular problems arising where visitors or appointed contractors are within the building.

An evacuation lift shall be provided with primary and secondary back up power supplies. An appropriate cause and effect matrix will be provided.

5.1 Escape Signage

Escape signage with appropriate illumination will be provided above all common exit routes and final exit doors within the building.

Any doors in the lines of fire resistance will be provided with appropriate fire signage. In general doors to staircases and sub-division corridor doors will be provided with 'Fire door keep shut' signage. Doors to cleaner's cupboards, stores, plant rooms and service risers will be provided with 'Fire door keep locked' signage.

5.2 Emergency Lighting

A system of emergency lighting will be installed in line with the current guidance where all areas are to have a provision.

The emergency lighting will comply with the recommendations of British Standard; BS 5266: Part 1 and be a non-maintained or maintained system as required, giving a minimum of 1 hour's duration.

6.0 STRATEGY FOR EVACUATION TO BE PERIODICALLY UPDATED AND PUBLISHED

It is proposed that there will be one evacuation zone to a place of safety for the building in the private car park. A thorough report detailing exit routes, evacuation points etc will be distributed to each occupier of the building and updated when required.

The evacuation strategy will be digitally recorded in the building O&M's. Any modifications or increase in occupancy will be reviewed as necessary. This is a requirement of the employer to be accountable for the on-going fire safety.

7.0 SUITABLE ACCESS AND EQUIPMENT FOR FIREFIGHTING

There will be suitable access and equipment for firefighting incorporated into the scheme in compliance with Building Regulations for commercial developments, for example, there will be fire extinguishers, etc.

As the building occupants are to be fully evacuated as a 'simultaneous evacuation' is to be in place, a fire detection and alarm system must be provided in accordance with BS5839 Part 1 Category L2. The main reason the higher level of fire detection is required is the provision of an automatic signal to an Automatic Receiving Centre (ARC), enables the Fire and Rescue Service to initiate a rapid attendance.

The building is less than 18m so there is no statutory requirement for a firefighting shaft.

The fire service vehicle access will be allowable to 50% of the building perimeter.

The internal access for the fire service will be via the protected staircase to all floors.

An addressable detection system will be provided, all in accordance with current building regulations 2010, as amended.

8.0 FIRE OVERVIEW & SAFETY MANAGEMENT

The active and passive fire precautions will be in accordance with current building regs. using BS9999-2017 fire safety guidance.

Hand-held fire-fighting appliances are not included. The fire strategy shall include, but shall not be limited to, consideration of the following issues:

Means of escape

- All travel distances are in accordance with BS 9999.
- Storey exit widths.
- Stair capacities.

Building separation

- The building is to be constructed of fire compartment floors.
- Each floor, zoned façade and core compartmentation shall be designed to eliminate the spread of fire and contain fire.

Passive fire protection measures

- Service risers.
- Cavity barriers and Fire stopping.
- Smoke seal.
- Fire door assembly will be procured and installed in accordance with the appropriate fire test certification.
- Fire rated glazed partitions.
- External wall specifications to achieve a minimum A1, A2-s1 or Class A,d0.
- Elements of fire rated structure (primary 60mins).

Active systems

- An automatic fire smoke detection and alarm system in accordance with BS 5839 Part 1 Category L2.
- Emergency lighting in accordance with BS 5266 to all escape routes and the required accommodation.

- Specifications of any fire safety equipment provided, including operational details, operators' manuals, software, system zoning and routine inspection, testing and maintenance schedules.
- Records of any acceptance or commissioning test.
- Any provision incorporated into the building to facilitate the evacuation of disabled people.

Fire Fighting Access

- An addressable detection system will be provided, all in accordance with current building regulations 2010, as amended.
- The fire service vehicle access will be allowable to 50% of the building perimeter.
- The internal access for the fire service will be via the protected staircase to all floors.
- Vicinity of building to boundary, to existing and future sites/buildings, to adjacent roads and pathways.

Fire Safety Management

- Management to ensure that all fire safety systems are tested and maintained.
- Preparation of a fire safety manual in line with approved document B and BS 9999:2017 to include:
 1. The fire strategy report and the fire safety management plan for the building
 2. A full and comprehensive `Final Record` Fire Strategy along will be provided.
 3. A management system will be in place for persons requiring assistance.
 4. A simultaneous evacuation plan will be provided.

9.0 REFERENCES

The Approved Document B Volume 2 2019 provides guidance for the Building Regulations 2010, as amended.

BS 5839 Part 1: 2019, Fire detection and fire alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance.

BS 5266 Part 1: 2016, Emergency lighting. Code of practice for the emergency lighting of premises.

BS 5499 Part 4: 2013 & BS EN7010, Graphical symbols and signs. Safety signs, including fire safety signs. Specification for geometric shapes, colours and layout.