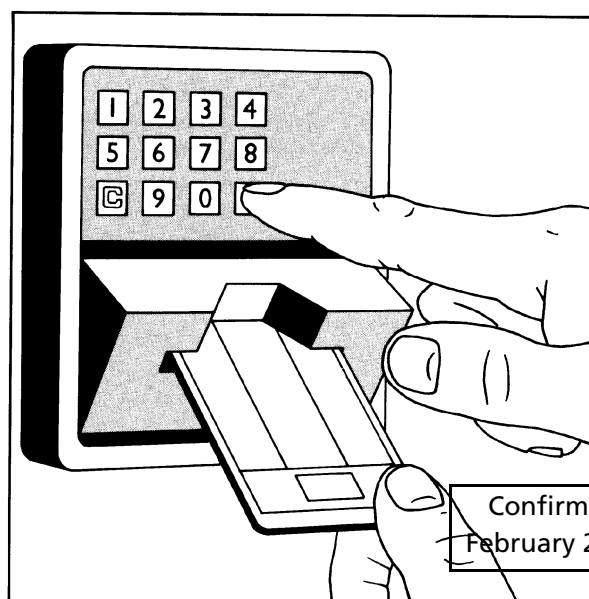
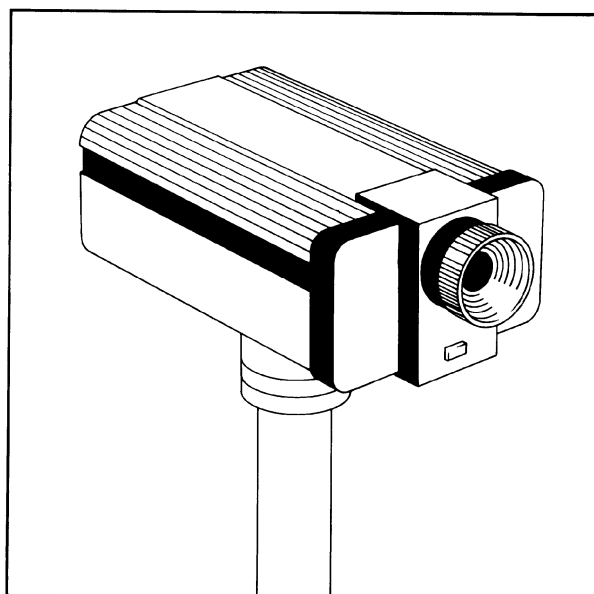
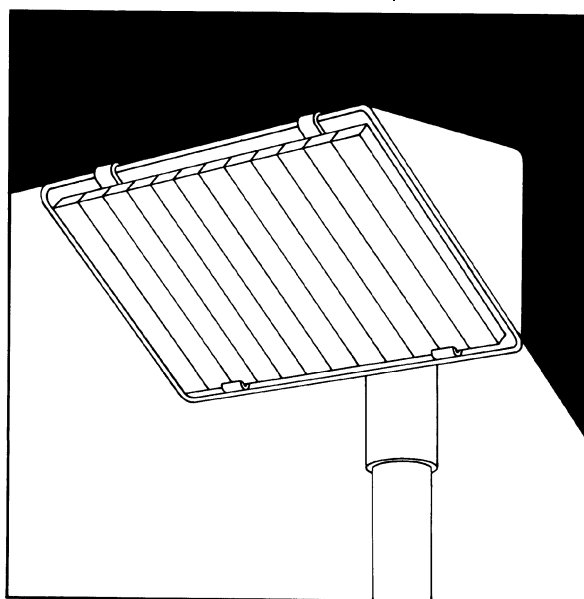
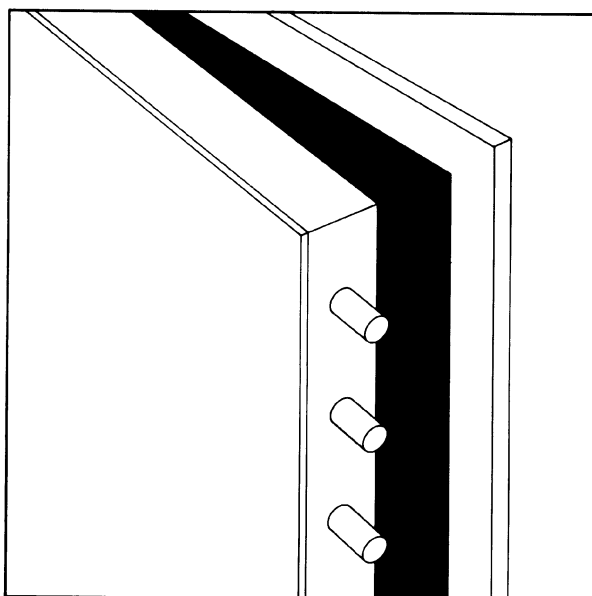


Guide for

Security of buildings against crime —

Part 2: Offices and shops



Confirmed
February 2012

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Technical Committee B/209, General building codes, to Subcommittee B/209/10, Security of buildings, upon which the following bodies were represented:

- Building Employers Confederation
- Chartered Institute of Building
- Chartered Institution of Building Services Engineers
- Department of the Environment (Construction Directorate)
- Local Authority Organizations
- National Council of Building Material Producers
- National House-Building Council
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Aluminium Window Association
- Association of Builders Hardware Manufacturers
- Association of Building Engineers
- Association of Burglary Insurance Surveyors
- British Lock Manufacturers Association
- British Retail Consortium
- British Security Industry Association
- British Standards Society
- British Woodworking Federation
- Chief and Assistant Chief Fire Officers' Association
- Consumer Policy Committee of BSI
- Department of the Environment (Building Research Establishment)
- Door and Shutter Manufacturers' Association
- Electricity Association
- Flat Glass Manufacturers' Association
- Glass and Glazing Federation
- Guild of Architectural Ironmongers
- HM Customs and Excise
- Home Office
- International Professional Security Association
- Loss Prevention Council
- Master Locksmiths Association
- Metropolitan Police

This British Standard, having been prepared under the direction of the Building and Civil Engineering Sector Board (B/-), was published under the authority of the Standards Board and comes into effect of 15 May 1995

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First published June 1987
Second edition May 1995

Amendments issued since publication

Amd. No.	Date	Comments

The following BSI references relate to the work on this standard:
Committee reference B/209/10
Draft for comment 91/14224 DC

ISBN 0 580 23692 7

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Foreword

This part of BS 8220 has been prepared by Subcommittee B/209/10. It is a revision of BS 8220-2:1987 which is withdrawn.

In this revision the guide has been considerably expanded to contain new sections on:

- a) selecting and adapting existing premises;
- b) locks and other security hardware;
- c) shutters, grilles and collapsible gates;
- d) access control to offices and parts of shops not open to the public;
- e) merchandise protection;
- f) computer centre security;
- g) security staff.

Additionally the following subjects are dealt with more comprehensively:

- 1) planning security;
- 2) management aspects of security;
- 3) intruder detectors and alarms;
- 4) surveillance systems.

The other Parts of BS 8220 are concerned with the security of the following:

- *Part 1: Dwellings;*
- *Part 3: Warehouses and distribution units.*

The guide has been compiled in such a way that it can be used by architects, designers, builders, manufacturers, specialists, managers, owners and occupiers.

The guide has been prepared at the request of the Home Office.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to x, pages 1 to 193 and a back cover.

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0 Introduction

0.1 General

Users who are primarily concerned with the management of offices and shops should read sections 1 and 2 before proceeding to the remainder of this guide.

Persons dealing with planning and design should first read sections 1 and 3.

Persons having the responsibility for selecting and adapting existing premises are recommended in the first instance to read sections 1 and 4.

The figures in this part of this standard are intended as guidance and should not be read as technical illustrations.

0.2 Expert advice

The guide should not be regarded as a substitute for expert advice. The intention is that it should complement it. In many places in the guide, readers are specifically advised to consult experts.

Every police force has officers who specialize in crime prevention work and who will advise designers, owners and occupiers. They welcome liaison with architects and planners on the security aspects of building design.

The local planning authority should also be consulted at an early stage for possible restrictions on security measures.

Insurers and security consultants will offer advice concerning the assessment of “risk” inherent in particular properties. Most insurance companies and the major insurance brokers employ security surveyors to advise their clients or their representatives on crime prevention measures and will welcome early liaison, preferably at the planning stage.

Manufacturers, suppliers, architectural ironmongers, locksmiths, lighting engineers, installers of intruder alarms, closed-circuit television (CCTV) and access control systems, builders and trade associations and security specialists have important contributions to make in their particular fields. Other useful sources of information include professional bodies, Chambers of Commerce and the British Retailers’ Association.

Advice can be obtained from the Fire Prevention Officer of the local fire authority when fire protection is involved as well as security, from the Health and Safety Executive and from the local authority on matters relating to safety and health, and from Building Control Officers if new buildings or major alterations are involved.

Specialist organizations¹⁾ are available for advice at the design stage on fittings that can be operated by disabled people without undue difficulty.

¹⁾ e.g. Centre on Environment for the Handicapped, 35 Great Smith Street, London SW1P 3BJ. Disabled Foundation, 380-384 Harrow Road, London W9 2HU.

Section 1. General guidance

INTRODUCTORY NOTE. Section 1 stresses that the guide is intended to complement expert advice and that it is not a substitute for it. Sources of expert advice are indicated in the introduction.

Comprehensive information is included on how professional burglars operate. Items attractive to them are summarized. Weaknesses and laxity in security, which may be exploited, are mentioned. Information is also included on opportunist burglary.

Precautions to minimize the chances and effects of deliberate fire-raising are described.

The need for security measures to take account of possible theft, criminal damage to property, malicious contamination of products and theft of information is stressed.

The possible serious consequences of crime are summarized.

The need for security to be planned rather than undertaken piecemeal, to be commensurate with the risk, and to be cost-effective is stressed. Broad guidance is given on how to draw up a security plan. The main aspects of security that need to be considered are shown pictorially.

The security plan has to take account of fire/emergency and safety and health constraints on security, and how to do this is explained.

1.1 Scope

This part of BS 8220 contains guidance on security measures aimed at forestalling both organized and opportunist crime on the premises of offices and shops.

Section 1 deals with ways that crimes are committed, the consequences of crime, risk assessment, security planning; and with fire, safety and health and insurers' requirements in so far as they relate to security.

Sections 2, 3 and 4 are concerned respectively with management, offices and shops being planned and designed and the adaptation of existing buildings.

The subsequent sections are concerned with windows, locks, doors, shutters, grilles, collapsible gates, glazing, roofs and other possible access points, lighting, intruder alarm systems, surveillance systems, access control, merchandise protection, cash handling and cash offices, strongrooms, safes, computer centres and the duties of security staff.

A comprehensive series of questions in the annexes affords a means of checking the adequacy of existing or proposed security measures.

NOTE The subjects of bombs, bomb threats and armed criminals are not covered in this guide. Advice on these matters should be obtained from the Police.

1.2 References

1.2.1 Normative references

This part of BS 8220 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 191. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this part of BS 8220 only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

1.2.2 Informative references

This part of BS 8220 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on page 191, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this part of BS 8220 the definitions given in BS 6100 apply, together with the following.

1.3.1
final secured exit
the exit/entrance used by the last person to leave or the first person to enter the premises, which therefore needs to be locked or unlocked from the outside

NOTE In BS 8220-1, the term “final exit” is used to refer to the door that has to be locked from the outside when securing the premises. The use of the term “final exit” in that sense has been avoided in this part of BS 8220, so removing the possibility of confusion with its longer established use in relation to means of escape in case of fire where the term is used to describe the terminal point of an escape route to an open space beyond which persons are no longer in danger from fire and can disperse in safety.

1.3.2
intruder alarm systems
with reference to section 12 of this part of BS 8220, the definitions for intruder alarm systems given in BS 4737-1 apply

1.3.3
shop
building or part of a building used for the sale of goods; comprising sales areas, also as appropriate, associated offices, storage areas and goods reception and despatch areas; access to sales areas by the general public being unrestricted during business hours

1.4 Criminal activities

1.4.1 General
Awareness of how criminals operate is needed if crime is to be averted.

1.4.2 Professional burglary
1.4.2.1 Preparatory work
Professional criminals often have undertaken a considerable amount of preparatory work before embarking on a burglary, e.g.:

- a) the operational regime of the premises will have been studied;
- b) the site will have been reconnoitred;
- c) casual or pre-planned information may have been obtained from staff or contractors' employees;
- d) means of defeating security measures will have been examined in depth;
- e) keys to the premises and buildings may have been obtained;
- f) a well planned escape route will have been established.

1.4.2.2 Items attractive to burglars
There are many items which burglars may wish to steal, e.g.:

- a) valuable attractive goods;
- b) goods easy to dispose of;
- c) goods for which disposal has been pre-arranged;
- d) goods easily accessible, stored internally or externally;
- e) loads from vehicles;
- f) loaded vehicles;
- g) unloaded vehicles for use in future crime;
- h) loaded pallets;
- i) cars to assist in removing goods and effecting a quick get-away;
- j) documents for use by burglars if apprehended, or for use in future crimes;
- k) information: financial, planning, technical.

1.4.2.3 *The burglary*

The exact way that a burglary will be carried out will depend on circumstances as shown in the following examples.

- a) Burglars will be equipped with tools to facilitate entry into premises and buildings.
- b) Useful equipment, materials, pallets, ladders and tools readily available on the site will be used, especially if they are known in advance to be there.
- c) Loaded pallets or stacks of unloaded pallets carelessly positioned may be used for climbing on, to overcome security barriers or for stealing otherwise inaccessible goods.
- d) Advantage will be taken of the absence of security guards and guard dogs.
- e) The obscurity provided by dark areas will be used.
- f) Weak and insecure doors, windows, accessible roofs, gates and fences will be exploited as appropriate.
- g) The building structure will be attacked if the prize is sufficient and if it is judged that this is the best way of operating without being detected. Perimeter fences may also be attacked.
- h) An accomplice may have been planted in the office or shop with the specific object of letting burglars in.
- i) An employee or other person having access during working hours may remain hidden until after the premises are locked up for the night.
- j) An employee may be forced to co-operate by threats of being taken as a hostage.
- k) Burglars may have sufficient knowledge to enable them to defeat intruder alarm systems.
- l) Telephone lines may be cut in an attempt to overcome the alarm system.
- m) Vehicles may be driven through shop windows or doors to effect robberies.

1.4.3 **Opportunist burglary**

Opportunist burglars will be attracted by valuable goods which can be readily transported and disposed of, and they will exploit lax security. In particular, the following should be noted.

- a) Certain types of merchandise on display in windows will be liable to be stolen if not adequately protected.
- b) Advantage will be taken of inoperative or poorly maintained security systems, also of the absence of security guards.
- c) The protection provided by dark areas will be used.
- d) Weak and insecure doors and windows will be exploited.
- e) Cars or vans may be stolen for removing goods.
- f) Repeat burglaries are likely if security is not improved.

1.4.4 **Theft**

Thieves take advantage of the display of goods in shops and will often utilize the cover provided by crowds. High value, portable and easily disposable goods can prove particularly attractive when security arrangements are lax.

Theft of the belongings of office and shop staff is more likely to occur when the staff are not provided with facilities for keeping them secure.

1.4.5 **Criminal damage by fire**

Many major fires are started by intruders. Frequently these are the result of a deliberate act.

The potential financial and consequential cost of such a fire can be disastrous to a business. In the context of this guide the many different motives of fire raisers are not important. What is important to an intruder is the ease of access and the availability of materials with or in which a fire can be started.

Security against entry to buildings may not wholly eliminate the risk of fire raising.

Access to the perimeter may permit the starting of fires by the introduction of means of ignition through openings such as broken windows and letter boxes, whilst fires started externally may also penetrate a building.

All offices and shops are potentially at risk to the fire raiser. As with other property, those at greatest risk are isolated or often unattended premises or those with little or no physical security.

Gaps beneath doors either should be as small as possible or should be sealed where practicable. Letter boxes should be provided with sheet metal receptacles on the inside. (See also 7.7.)

The provision of an automatic fire detection and extinguishing system, e.g. sprinklers, with an automatic alarm transmission facility, can provide an early warning of fire and enable the development of a fire to be restricted by the Fire Brigade or trained fire teams.

Hazardous goods such as flammable liquids and gas cylinders should be kept to the minimum necessary. Further stocks of such materials should be locked in special stores, particularly outside working hours. A high standard of housekeeping and the implementation of good fire management can frustrate a fire raiser's attempts to cause a rapidly developing fire and can restrict fire spread and consequent damage.

The risk of an external fire (involving, for example, combustible waste) spreading into the building should not be overlooked. (See also 15.4.3.)

1.4.6 Criminal damage to property

Some criminals will set out to damage property. This damage can affect the operation and security of the premises.

NOTE The wilful destruction or damage of property is an offence under the Criminal Damage Act 1971 [1]. The Act also covers threats to damage or destroy property, and the possession or control of the means to damage or destroy it.

1.4.7 Malicious contamination of products

Some organizations and individuals set out to threaten or actually contaminate products, e.g. food and drugs, as part of a protest campaign, usually with extortion in mind and very often of a hoax nature.

When the threat of product contamination is a serious risk, stringent security precautions need to be taken in consultation with the police. Effective security will reduce opportunities to contaminate products and to perpetrate a hoax.

The security measures to prevent product contamination in shops are not necessarily similar to those needed to prevent entry for burglary and theft.

The consequences of such threat, and of resulting contamination, can be very serious indeed. Consumers may be made ill; in extreme instances contaminated products may be the cause of death. Adverse publicity even in hoax cases can have serious repercussions on trade.

NOTE Section 38 of the Public Order Act 1986 [2] creates an offence of contamination of or interference with goods with the intention of causing public alarm or anxiety. Additionally, for a person to threaten contamination or claim to have done so also constitutes an offence under the Act.

1.4.8 Theft of information

The object of some thieves is to steal information likely to be useful to unscrupulous persons. Deliberate interference with information may also cause disruption or assist concealment of the theft of goods.

1.4.9 Local crime

The extent and nature of local crime should be taken into account when considering security. Advice should be obtained from the Crime Prevention Officer of the local Police.

1.5 Consequences of crime

The security measures to be adopted should take account of the consequences of crime, e.g.:

- a) value of the goods that may be stolen;
- b) consequences of damage to property;
- c) possible disruption to or loss of business;
- d) possible inability to supply customers in the short term and perhaps also in the somewhat longer term;
- e) any penalties for not supplying goods on time;
- f) effects on future insurance premiums or the continuation of insurance cover;

- g) possibility that staff may be temporarily left without work;
- h) any damage to the good name of the company;
- i) possibility that the existence and operations of the company may be compromised, e.g. from company liability for negligence or for damage to or contamination of products. The potential loss of trade resulting from a loss of reputation could also compromise the existence and operations of the company;
- j) adverse effect on staff.

1.6 Risk assessment for cost effective security

The aim should be to provide cost effective security. A decision whether the estimated risk justifies high, medium or low expenditure on security will depend on the nature of goods stored and consideration of the matters shown in Figure 1. Many security options are available.

At the low risk end of the scale, the use of security locks and simple intruder alarm systems may be sufficient, provided that the building is reasonably well-constructed. In these circumstances, the responsibility for each of the security aspects shown in Figure 1 will often need to be allocated to persons whose prime tasks are concerned with the operation of the office or shop.

At high risk sites, the allocation of responsibility to operational staff of certain vital security tasks will generally not suffice. Full time security staff operating 24 h per day will often be needed. Furthermore the overall responsibility for security may need to be vested in a person(s) with specialist knowledge in this field. Specially designed buildings, security lighting, comprehensive intruder alarm systems and extensive use of closed-circuit television (CCTV) and electronic access control to office areas may, for example, all be needed.

It will be necessary to keep under constant review the adequacy of security measures regularly, otherwise changes in circumstances which merit changes in security measures may be overlooked.

1.7 Planning security

There should be a plan which covers all aspects of security; some aspects may be overlooked if planning is piecemeal. In a new building, security is a major consideration and one which the client and consultant architect need to address early in the design process.

Expert advice should be sought (see Introduction).

The plan will be crucially affected by the decision as to whether security guards will be employed at night and at other times when the premises are unoccupied, or whether the site will be left unmanned.

A full-time senior security officer may be an essential ingredient of a satisfactory security system.

Security should be kept under constant review and supervision by management (see section 2), should be planned and designed into a new building (see section 3) and should be considered before an existing building is purchased (see section 4).

Means of escape is under statutory control in all buildings.

Figure 1 indicates the wide range of matters that need considering when a security plan is being drawn up or reviewed. These matters are dealt with in detail in sections 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18 of this guide.

1.8 Fire/emergency and other constraints on security

1.8.1 General

The security measures for an office or shop should not negate any facilities, or procedures, associated with fire and emergency precautions, particularly means of escape in case of fire. Such facilities and procedures may be required under a number of statutory provisions, such as those covering fire precautions, town and country planning, building regulations, petroleum licensing, storage of liquefied petroleum gas, and the keeping of explosives.

Particular care may need to be taken to ensure that any fire precautionary requirements in respect of basement car parks, service areas, loading bays and refuse holding facilities are not prejudiced.

Steps should be taken to ensure that all relevant enforcing authorities are consulted before any alterations are made to the structure or layout of the premises or to procedural arrangements. In considering the effect on fire precautions, reliance upon practical experience alone is unlikely to be satisfactory and it is important to consult the relevant enforcing authority. Guidance regarding acceptable standards of fire precautions may be found as follows:

- a) in BS 5588-2, BS 5588-3 and BS 5588-10;
- b) in Home Office Guide to fire precautions in existing places of work that require a fire certificate: factories, offices, shops and railway premises [3];
- c) in Home Office Code of Practice for fire precautions in factories, offices, shops and railway premises not required to have a fire certificate [4];
- d) from the local authority building control department. The interpretation and specific application of the guidance should be confirmed before proceeding with additional security arrangements.

1.8.2 Constraints related to fire

It is a basic principle of fire safety that any door which affords means of escape should be able to be opened immediately by occupants, without the need for a key or any special knowledge, on their way out of the building.

Any exception to this general principle, unless approved by the appropriate enforcing authority, can result in prosecution.

When assessing security provisions it is advisable to consider fastenings that do not need keys when the premises are occupied. It may however be acceptable to the appropriate authority for these fastenings to be supplemented by key-operated locks for additional security during periods of non-occupation, but there should be a reliable procedure for ensuring that such locks are inoperative during hours of occupation, including periods when cleaners, security and maintenance staff will be present.

Security fastenings and hardware can also raise a problem when used in conjunction with fire-resisting doors. Any devices that necessitate the cutting-away of any part of a door may reduce the fire resistance to an unacceptable extent. Detailed advice on this matter is available from the relevant enforcing authority. It should be noted that there may be constraints derived from conditions of planning consent and also that there are requirements relating to fire doors and emergency exit doors to satisfy the Building Regulations. None of these conditions should be breached without prior approval of the local authority concerned. Requirements relating to fire are also contained within other statutes and it may be necessary to consult other enforcing authorities before commencing any alterations to fire exit routes or fire-protecting structures, including doors.

It should also be borne in mind that security measures which restrict access for the Fire Brigade in the event of fire may result in greater fire damage to a building and its contents by delaying the fire-fighting attack at its most crucial stage. Such security measures may also infringe relevant legislation which requires such access.

1.9 Safety and health

Security is influenced by considerations of safety and health. The following should be taken into account:

- a) statutory requirements;
- b) substances which can produce flammable atmospheres;
- c) flammable and combustible materials;
- d) toxic substances;
- e) dangerous chemicals.

NOTE These matters are dealt with in more detail in 3.7.

The Building Regulations for the UK include requirements for safety of the users of buildings and set requirements for or impose restrictions on the design of bars, grilles and similar open components, to prevent accidents due to contact with glazing and also children becoming entrapped in the openings. These requirements may therefore take precedence over any design requirements given in this standard for bars, grilles or other open barriers used for security purposes.

The regulatory requirements are contained in:

- 1) The Building Regulations (England and Wales) 1994. Parts K and N [5];
- 2) The Building Standards (Scotland) Regulations 1990. Part S [6];
- 3) The Building Regulations (Northern Ireland) 1991. Part H [7].

Guidance on the requirements is contained in the appropriate approved documents or technical standards accompanying the regulations or in BS 5395, BS 6180 and BS 6262. Advice on whether the regulations apply for specific circumstances can be obtained from the local authority.

1.10 Insurance

Insurers' security requirements will need to be obtained to ensure that they are satisfied. Such requirements should be reviewed on a regular basis as the business grows.

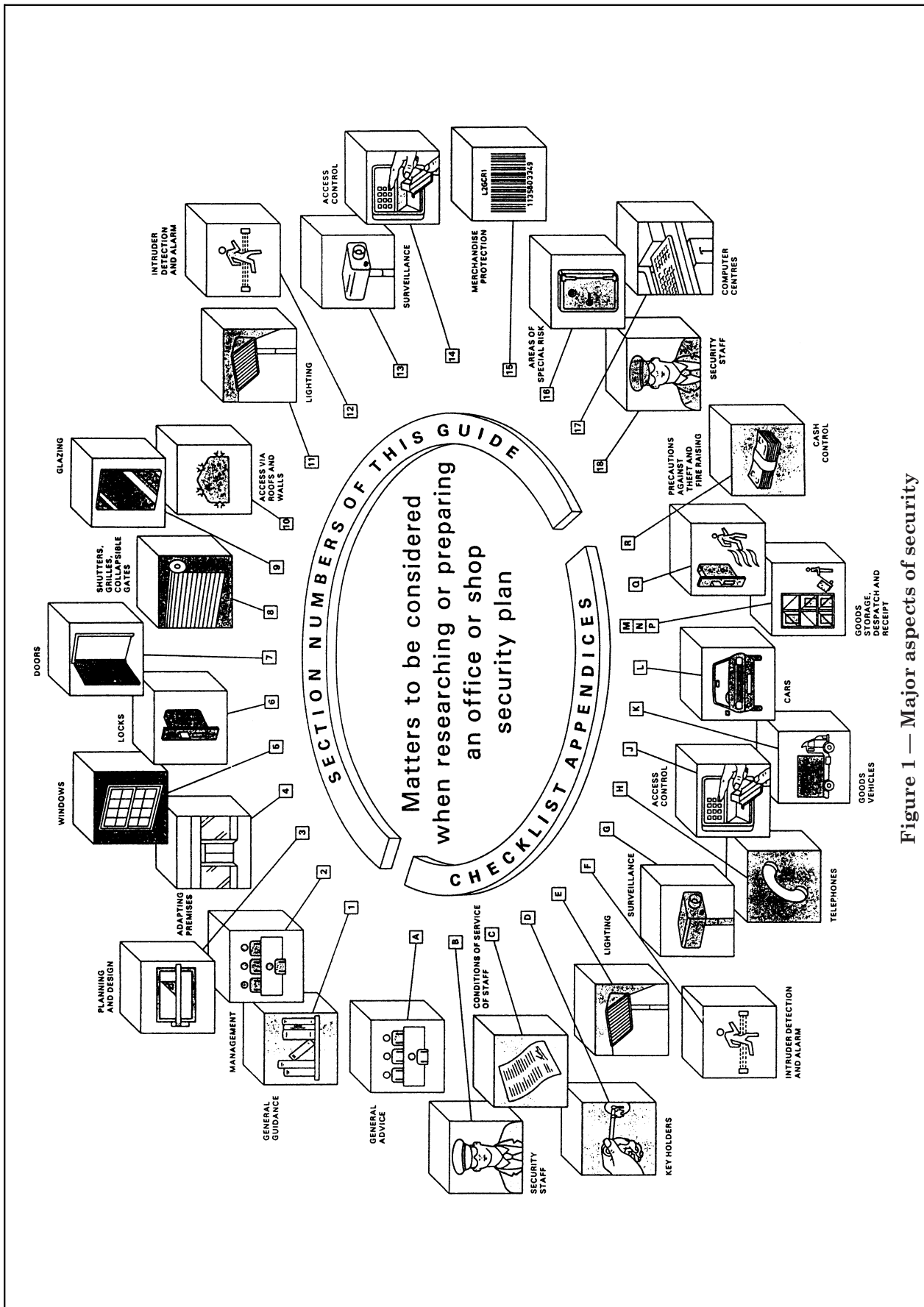


Figure 1 — Major aspects of security

Section 2. Management aspects of security

INTRODUCTORY NOTE. Section 2 summarizes important matters which management should consider when organizing and reviewing security arrangements.

In some offices and shops all or most of the points listed will be relevant; in others, only some. The object is to help management to identify the matters which are of interest to them and to avoid, as far as is practicable, any facets of security being inadvertently overlooked.

The wide-ranging subjects are dealt with very briefly. There are comprehensive references to other parts of the guide, so that more detailed information can be called up as needed.

2.1 General

A person of sufficient status and knowledge should be in charge of day-to-day security.

Consideration should be given to the desirability of employing a security consultant to help with planning and to provide immediate technical and other assistance if problems arise.

All employees should be involved in security and should be made aware of company policy.

2.2 Using the guide to improve security

Annex A to Annex S pose a number of questions that will enable managers to appraise quickly whether existing or proposed security arrangements will be effective.

The actions, if any, needed after reading these annexes will mostly be one or more of the following:

- a) self-evident;
- b) clear after reading other appropriate section(s) of this standard;
- c) need consideration with experts such as the Crime Prevention Officer of the local Police, the relevant enforcing authorities on fire and other matters, insurers, security specialists, architects, designers, builders, manufacturers and suppliers. See also the introduction. Consultation with the occupier(s) of adjacent buildings may also be desirable and/or necessary, e.g. consideration may need to be given in a trading estate to a precinct security service.

2.3 Local crime pattern

The protection for the site should take cognizance of the pattern of crime in the district. The relevant information can be supplied by the Crime Prevention Officer of the local Police.

2.4 Criminal damage

Precautions need to be taken against criminal damage. (See 1.4.5, 1.4.6 and 1.4.7.)

2.5 Security staff

The presence of a 24 h security service manned by trained staff is a strong deterrent to criminals.

All concerned should be fully aware of the duties to be undertaken by the guarding force. The functions of security staff are dealt with in detail in section 18. Expert advice should be sought on suitable guarding forces.

2.6 Windows

Windows should be provided with protection commensurate with their type, function and the risks that they present both as possible points of forced entry for intruders and for theft of goods (see 5.2).

2.7 Doors and shutters

Doors and shutters of the appropriate types, installed correctly and incorporating good locks, are recommended. (See sections 6, 7 and 8.) Locks should be immediately changed when keys are lost.

2.8 Glazing

Glazing is generally a security risk. The risk can be reduced by attention being paid to the type of glazing. (See section 9.)

2.9 Building fabric

Weakness in building fabric and construction will be exploited by criminals who are sufficiently determined and can operate unobserved. Sometimes it may be necessary to provide added protection behind walls by sterile spaces incorporating intruder alarms, the sterile spaces themselves being backed by steel caging within the building.

2.10 Other access points

Weak roofs, roof voids and roof openings, service zones, ventilation shafts, suspended floors, wall apertures, cellar flaps and gratings, access points from below ground and from adjacent properties, can all afford opportunities for criminals, particularly where they are easily accessible. External drainage pipes and architectural features, such as porches, may also be used. These various items need to be examined for adequacy of protection. (See section 10.)

2.11 Perimeter

Parts of the premises which are not observable from other premises or by the public can provide locations for criminals to operate for considerable periods during the hours of darkness without being detected.

In appropriate circumstances, perimeter fences (see 10.6) supported by intruder alarms can provide additional obstacles for criminals.

2.12 Lighting

Good and properly located lighting will greatly increase the chance of deterring and detecting criminal activities. (See section 11.)

2.13 Intruder alarm systems

Intruder alarms suitably sited are a very effective means of deterring and detecting criminals. (See section 12.)

2.14 Telephones

Public telephones and freephone taxi telephones should be located in positions where callers do not have a view of cash tills. (See 15.13.)

2.15 Telephone cables

Determined criminals may cut or tamper with telephone cables, in order to defeat an intruder alarm system and to isolate security staff. (See 12.10.)

2.16 High-risk areas

High risk areas such as cash offices and computer rooms may need to be protected by two doors separated by a small passage. These areas may need to be further protected by CCTV and/or an alarm system and/or an electronic access control system. (See sections 12, 13, 14 and 17.)

2.17 Surveillance systems

Closed-circuit television (CCTV) has many applications in an overall security system. It is an excellent method of surveillance during business hours. At other times it can be used to trigger an alarm when movement in the viewing area is detected under good lighting conditions. Infra-red assisted cameras have application where illumination is inadequate.

Surveillance cameras can provide a useful deterrent to crime as the information obtainable from the photographs can lead to the identification and conviction of criminals. (See section 13.)

2.18 Access control

The access and egress of staff, goods vehicle drivers, contractors, those concerned with maintenance and servicing activities and visitors to offices and domestic areas need to be regulated. (See section 14.)

2.19 Goods storage, despatch and reception

Any weaknesses in goods display, storage, despatch and reception arrangements can be exploited. Criminals may be interested in stealing documents as well as goods. The documents may be useful in relation to goods stolen at the time or for use in future crime. (See section 15.)

2.20 Especially valuable goods

Special storage arrangements may be needed for particularly valuable goods. (See 3.5.5.)

2.21 Goods vehicle drivers

The identity of goods vehicle drivers and their reasons for attending the premises should be verified. Particular attention should be given to the credentials of goods vehicle drivers not previously seen.

2.22 Contractors' employees

Control should be exercised on the site activities of contractors' employees and of sub-contractors; their presence can provide the opportunity for criminals to reconnoitre a site with a view to planning a burglary.

2.23 Staff integrity

Careful vetting of staff is essential. The presence of one of an organized gang of criminals on the staff could pave the way to a major burglary. (See also Annex C.)

2.24 Key security

A controlled system for key security is essential. (See section 6 and Annex D.) Keys should only be issued to authorized staff who should sign for them. Each key should be individually identifiable.

2.25 Guard dogs

Guard dogs can sometimes be of assistance to security guards when carrying out surveillance, particularly outside business hours, but the use of CCTV facilities may be a preferable alternative.

Guard dogs should be controlled and licensed as necessary in accordance with the Guard Dogs Act 1975 [8].

2.26 Day-to-day supervision

Day-to-day supervision will be necessary to ensure that security measures are effective at all times.

2.27 Checking and maintaining security measures

Frequent checks should be made by key holders and other responsible persons to ensure that all security measures are in good working order. Defects should be rectified immediately.

2.28 Emergencies

There should be well-practised contingency plans for coping quickly with emergencies, e.g. fire, bomb threat, robbery and personal attack, without compromising security. When different emergencies are likely to necessitate different actions by personnel, the means of giving the appropriate warnings or instructions should be sufficiently distinct to avoid confusion.

2.29 Personal attack

There may be a need for strategically placed alarms, which can be deliberately operated for the protection of staff in event of personal attack. (See 12.5.9)

2.30 Public address system

In larger premises there may be a need for a public address system to warn people quickly of an emergency.

2.31 Mechanical handling equipment

Facilities should be available for securing and immobilizing mechanical handling equipment when not in use, so the equipment cannot be used by criminals.

Section 3. Planning and design

INTRODUCTORY NOTE. It is recommended that the security measures needed for a new office or shop are considered in depth at the planning stage. To leave this consideration to a later stage is to run the risk that the siting and the design of the office or shop may place undesirable restrictions on the security measures that can be employed. Security can also generally be provided most economically at the construction stage. General guidance is given on the matters that need to be considered when choosing a site and in the drawing up of a security plan.

More detailed guidance is given on security matters that need to be considered when planning and designing the curtilage, the perimeter of buildings, goods reception and despatch areas and the interior of buildings. Fire precautions and safety and health constraints which can affect planning and designing for security are indicated.

Expert advice is needed when planning the security of an office or shop. Sources of such advice are listed.

3.1 Expert advice

Expert advice is required when planning the security of an office or shop. Advice and assistance is available from a number of sources, including the Crime Prevention Officer of the local Police, Police Architectural Liaison Officers, security consultants, the building control authority, manufacturers and suppliers of security equipment, and insurers. The British Retailers' Association, Chambers of Commerce, local planning authorities, architectural ironmongers, locksmiths, local professional bodies and trade organizations can help to supplement this advice. See also the introduction.

Advice can be obtained from the Fire Prevention Officer of the local fire authority when fire protection is involved as well as security.

3.2 The site

Consideration should be given to:

- a) the extent to which the selection of the location of premises will be pre-determined by other considerations, and the extent to which the selection of a site can be influenced by security factors;
- b) the extent to which security provisions will be influenced by a proposed location, taking account of:
 - 1) isolation of the premises if rural;
 - 2) kinds of crime that may occur if the premises will be in inner city areas;
 - 3) any special considerations, e.g. if the premises will be in a suburban area;
- c) existing or potential levels of crime locally, in relation to burglary, theft, fire-raising, vandalism and other criminal damage;
- d) proximity to areas of public gathering, e.g. football grounds, licensed premises, dance halls, playgrounds and housing estates;
- e) the extent to which security problems may be influenced by the weather, the season or seasonal factors such as an influx of tourists;
- f) the possibility of gaining additional security by natural features provided, for example, by rivers, streams and broken ground;
- g) advantages that can be obtained from proximity of constantly manned premises, such as police, fire and ambulance stations or from existing security perimeters of well maintained premises with high walls or fences;
- h) benefits that can be obtained from existing street lighting;
- i) levels of security that owners and occupiers of other premises in the district apply to their properties;
- j) surveillance factors, e.g. the extent to which a property can be seen from other properties.

3.3 Security plan

A security plan should be devised prior to the design of an office or shop; it should complement the operational plan. The security plan should encompass the following:

- a) an assessment of the risk in relation to the value of the property and the items that need to be protected;
- b) the need or otherwise to employ security staff during and/or outside business hours;
- c) the accommodation requirements for security staff;
- d) the need for security lighting;
- e) the intruder detector and alarm system to be adopted;
- f) the need for secure telephone lines and cables for transmitting alarm signals and for emergency use;
- g) the use that is to be made of CCTV both during the day and at night, and whether it is for use internally and/or externally;
- h) the access and egress control arrangements for staff, goods vehicle drivers, contractors, maintenance engineers, cleaners and visitors;
- i) the facilities needed for goods and passenger vehicle security;
- j) the need for cars to be kept away from the secure area but to be kept under surveillance for their own security;
- k) the effect of the uniformity or conversely the diversity of goods on the design of goods reception and despatch areas;
- l) the facilities needed for the protection of especially valuable goods, information and cash;
- m) the need for external storage compounds;
- n) the need or otherwise for a security fence;
- o) fire precautions;
- p) precautions needed for hazardous goods;
- q) insurance requirements.

3.4 External and structural features

3.4.1 General

The perimeter of all buildings should be secure and robust, and due regard should be given to the standard of security, use and structure of adjoining buildings and of any shared facilities.

Particular attention should be paid to the security of exposed entrances, exits and roofs.

3.4.2 Approach/entrance

The location and type of entrance should take account of both customer, staff and visitor convenience and the need for good security.

Clear directional signing, well maintained control facilities (manual, mechanical or electronic), efficient lighting and unobstructed sight lines will assist.

3.4.3 Shared facility

The security of premises needs to take account of the security on any shared entrance or exit. Mutually agreed security arrangements for common roads and common services should be made where appropriate.

3.4.4 Service roads

Good lighting, provision of surveillance facilities where needed, clear road marking and other information signs, will improve supervision of traffic.

Whenever possible it is advantageous for goods vehicles to use roads separate from those used by private cars.

3.4.5 Shopping complexes

In deciding the level of security of an individual unit within a shopping complex, it should be considered whether the complex will be closed to the public outside normal working hours. Normally a unit in a complex which is closed will be more secure and will need a lower level of security than would otherwise be necessary.

3.4.6 Bus stops and waiting areas

The proximity of bus stops and waiting areas near perimeter walls or entrances or exits may result in a need for additional security measures.

3.4.7 Parking

3.4.7.1 *External*

Parking areas should be designed to prevent vehicles parking directly against secured buildings and boundary fences. The security of parking areas can be enhanced by good access control and supervision.

The aim should be for efficient vandal resistant exterior lighting, clear and well sited directional and “conditions of use” signs with designated areas for private, service and goods vehicles, and clear access for emergency services. Where appropriate, zones should be allocated for cycles, trolleys and perambulators.

3.4.7.2 *Internal*

Car parking facilities are now an essential part of office and shop developments.

Each type of car park (ground level, multi-storey or basement) presents particular problems of security which can be minimized by good access control and supervision.

3.4.7.3 *Additional precautions*

Surveillance can be improved by closed circuit television (CCTV) and photographic surveillance systems (see section 13).

Surveillance can also be provided by allowing an accredited company, e.g. a 24 h taxi service, to make use of the car park (see also Annex L).

3.4.8 Goods reception and despatch areas

3.4.8.1 *General*

Planning and design should, as far as practicable, take account of the fact that there are opportunities for theft and other crime at points where goods are received and despatched. Design can help to minimize these possibilities. Where circumstances permit, it is desirable for goods reception and despatch areas to be separate. Wherever practicable, goods reception and despatch areas should be separated from entrances used by staff and visitors.

3.4.8.2 *Shutters and doors*

Substantial shutters, or doors, should be fitted to the unloading or loading bay entrance/exit (see section 8).

Shutters/doors should be fitted with a viewing panel to check on callers.

Where possible, a separate door should be provided for pedestrian access/egress to and from goods reception and despatch areas.

3.4.8.3 *External unloading and loading bays*

External unloading and loading bays should be constructed so that the entrance is tailored to the sizes of vehicles or trailers. Rubber or plastics screens can be fitted to adjust the width.

3.4.8.4 *Size of reception and despatch areas*

Reception and despatch areas should be of sufficient size to enable goods to be checked correctly before being moved away from the unloading bay/area.

3.4.8.5 *Parking arrangements for private cars*

Wherever possible, private cars should not be able or be permitted to park close to or alongside goods reception or despatch areas. (See also 14.3.)

3.4.8.6 *Lighting*

The area should be well lit (see section 11).

3.4.8.7 Blind spots

Design should be such that there are no obstructions or cavities in which goods can be hidden or lost. Strategically placed mirrors can assist in the supervision of blind spots.

3.4.8.8 Reception and despatch area offices

Reception and despatch area offices should be secure. There should be good visibility from these offices over the whole of the unloading and loading areas.

Consideration should be given to the provision of special reception areas within the building to which goods vehicle drivers should report.

3.4.8.9 Closed circuit television (CCTV)

The use of CCTV can assist in the supervision of goods reception and despatch areas (see section 13).

3.4.8.10 Intruder alarms

Intruder alarms will often be essential for the protection of goods reception and despatch areas. It is important that they should be of appropriate types and that they should be correctly located (see section 12).

3.4.8.11 Documents, records, seals, straps etc.

A secure place for storing documents, records, seals, straps, etc., should be provided.

3.4.8.12 High value goods

Where possible there should be provision for high value goods to be placed in a separate security area whilst awaiting removal to their final location in the office or shop.

Particular attention should be paid to the safeguarding of these separate areas from attacks via roofs.

3.4.9 Essential service facilities

Designers should consider the potential for unauthorized entry using facilities for essential services, e.g. goods lifts, fuel delivery points, ventilation ducts and conveyor openings. Where possible such services should be concealed and/or located in locked compartments.

Provision should be made for the security of exposed mains and emergency utilities, e.g. generators and telephone ducting.

3.4.10 Waste disposal areas

Waste disposal areas should be separate from goods reception and despatch areas, wherever practicable.

3.4.11 Building fabric

The use of robust construction and materials, e.g. those resistant to manual attack or damage, is essential to the initial provision of security. The possibility that structures can be destroyed by criminals driving into them, or by towing away protective grilles, may also need to be considered.

When lightweight construction is being considered, e.g. frangible sheet cladding, security can be enhanced by a reinforcing lining such as welded steel mesh.

3.4.12 Building line and facings

An unobstructed building line and smooth facings have obvious security advantages. Accessible ledges, parapets, indentations, protrusions and sills can provide means of assisting unlawful entry.

3.4.13 Roofs

Proper planning of roof areas can contribute greatly to security. Sound construction and good materials are essential.

Particular care needs to be given to skylights, access windows and doors, especially when they are out of sight. Strategic exterior lighting coupled with CCTV, and good physical security of roof approaches including adjoining roofs and ceiling voids, should be considered.

The subject of access through roofs is covered in section 10.

3.4.14 Accessible windows

As far as other considerations will allow, the number of windows that are accessible to intruders should be kept to a minimum.

Matters that need to be considered from a security stand point are:

- a) size and shape;
- b) choice of frames;
- c) method of opening;
- d) types of locks and fastenings for openable windows;
- e) advantages that can be obtained from the use of fixed windows where other considerations allow;
- f) additional security provided by bars, grilles, shutters and collapsible gates, especially for display windows;
- g) additional security provided by street furnishings such as bollards, against ramming by vehicles.

Windows are dealt with in detail in section 5.

3.4.15 External doors and shutters

External doors and shutters are often the focus of criminal attention. Points that need to be considered are:

- a) siting;
- b) keeping the number of entrances/exits to a minimum;
- c) design and strength of doors and frames;
- d) choice of glazed panels;
- e) type of wood, glass or metal;
- f) advantages of solid core doors;
- g) mandatory requirements regarding fire exits;
- h) restrictions on fastening emergency exit doors;
- i) the advantages of a single leaf hinged door for a final secured exit.

Doors are dealt with in section 7; shutters in section 8.

3.4.16 Locks and other security hardware

Locks should be selected so that they play their full part in combating security risks.

Locks for doors and shutters are dealt with in section 6, which contains extensive details on types, designs and recommended use of locks and other security hardware.

3.4.17 Glass and glazing

Glazing should be kept to the minimum. Factors affecting security are:

- a) type;
- b) thickness;
- c) strength;
- d) fixing to frame;
- e) double glazing.

Glass, plastic sheeting and glazing are dealt with in section 9.

3.4.18 External pipes

External pipes should be flush or concealed. If these cannot be fitted the use of plastics pipes, continuous mild steel angle pipe supports to prevent climbing (Figure 43), umbrella spikes, barbed wire, or in some cases the application of anti-climb paint should be considered.

3.4.19 Telephone cables

Criminals often aim to cut main telephone wires to prevent emergency calls being made and to interfere with alarm systems where they are connected to the telephone system. Proper planning of alarm and telephone systems can minimize these risks (see 12.10). It is particularly important that telephone cables should be adequately concealed and protected. It is evident that the necessary provision to achieve this should be made, wherever practicable, at the design stage.

3.5 Building interior

3.5.1 Reception areas

Whilst there may be commercial reasons to make the reception areas of shops and offices open and inviting, it is in such areas that a clear message can be given to customers and/or visitors that a controlled system of security exists.

Reception desks should be well sited to provide the best vision for staff.

Controlled access can be provided by revolving doors or metal swing barriers. Where such doors or barriers occur across routes forming part of a means of escape, approval for their use should be obtained from the relevant enforcing authority. Entrance alarms ranging from those triggered from simple door activation to sophisticated CCTV monitoring should complement good administrative procedures.

Good lighting and clear security notices are also advisable. Access control for reception areas is dealt with in section 14.

3.5.2 Display areas

In display areas there is often a conflict between good security and commercial considerations. Designers and planners can assist in reducing security problems by providing good lighting, clear sight lines between displays and by avoiding blind corners. Security surveillance is essential and this can range from simple two-way mirrors to extensive CCTV cover.

Proper securing facilities should be provided for the more valuable goods and office equipment, for example by wall or floor attachments, or security cabinets.

3.5.3 Counter, till, check-out areas

Design should provide for good control of check-out/payment areas of shops. Provision should be made for the security of tills and takings by providing floor safes, cash chutes and till guards.

Additional security can be provided, where needed, by CCTV surveillance and emergency signalling systems. (See also 3.5.11.)

3.5.4 Cash offices and strongrooms

The provision of an inner security area for cash and other valuables can be a vital necessity.

Design considerations should include the following:

- a) assessing the threat;
- b) deciding the ideal site within the building;
- c) using the best construction and materials;
- d) providing adequate resistance to water and fire damage;
- e) assessing the need for ventilation and emergency exits;
- f) ensuring good two-way visibility;
- g) providing CCTV and alarm protection;
- h) providing automatic fire detection;
- i) providing a protected internal lobby;
- j) providing heavy duty doors and locks (manually or electrically operated);
- k) providing suitable safes and fittings;
- l) providing fire-resistant cabinets;
- m) providing security cupboards;

- n) providing key control facilities;
- o) providing facilities to control access and enhance vigilance, e.g. so that only one person at a time can enter under supervision.

Cash offices are dealt with in **16.1**. Strongrooms are dealt with in **16.2**.

3.5.5 Inner store for high value goods

A well-ventilated secure room or inner storeroom may be needed for storing higher value goods.

In other instances, a wire cage protected by a lockable door may suffice. Metal or plastics seals, good control of access and restricted issue of keys are additional protective measures that may need to be taken. An intruder alarm may need to be fitted to the room or cage structure.

Where such additional structures are constructed after a building has been approved for means of escape, care will be needed to ensure that the means of escape are not impaired.

3.5.6 Staff possessions

Staff should be provided with secure storage facilities for their possessions.

3.5.7 Installation of plant, equipment and service

The building design should allow for plant, equipment and services such as important switches, freezer cabinets and cold room control to be installed in such a way that they cannot be accidentally or deliberately damaged; for some equipment it may be necessary to guard against theft.

The areas for housing such equipment should be designed in such a way that they can be kept clear and tidy.

3.5.8 Electricity supply

All electricity supplies for lighting, intruder alarms and fire alarms should be made as secure as possible. Dedicated circuits, mechanical protection of cables and secure routes for cables may be needed to supplement a reliable source of supply. In high risk situations stand-by generation equipment may be needed. The stand-by generator should be able to restore power within 5 s of a mains failure.

Further information on this matter is contained in **11.7**.

3.5.9 Intruder alarm systems

Design should allow for the installation of appropriate intruder alarm systems as necessary. This is an area where expert advice is particularly necessary because of the rapidly developing technology.

Intruder alarms are dealt with in section **12**.

3.5.10 Fire alarms

Fire alarms have relevance to security as fires can be started with criminal intent.

Fire alarm signals can often be transmitted to an alarm monitoring station using the same signalling equipment as an intruder alarm system installed in the same premises.

3.5.11 Computerized monitoring systems

On some sites especially those having a range of security devices, e.g. card access control and CCTV, the alarm system can form part of a network which monitors and controls environment, e.g. heat, light, ventilation, and the energy needed for refrigeration of stored goods.

During the design of such comprehensive systems, care is necessary to ensure that the security equipment and signals will be unaffected by the demands of the environmental or other services. This protection needs to be ensured under normal operating conditions, during maintenance and, as far as practicable, when the system is subject to a fault condition.

3.5.12 Telephones

Telephones should not be readily accessible to criminals. Telephone wires and internal cables should be sited and installed in such a manner that they cannot be easily cut.

Public telephones and freephone taxi telephones should be located in positions where callers do not have a view of cash tills.

3.5.13 Personal attack alarms

There may be a need for the installation of strategically placed personal attack alarms, for protection of staff working in places such as cash offices, or areas where there is cash or valuable stock.

3.5.14 Emergency evacuation

The internal layout and design of access control systems should be such that emergency evacuation of the premises can be effected quickly.

3.5.15 Public address system

In larger premises there may be a need for the installation of public address systems. One of the uses would be to warn people quickly of an emergency.

3.6 Fire precautions

Fire may arise either accidentally or due to criminal activities. Design needs to be such as to minimize the possible chances and effects of fire. It is necessary that security measures should not conflict with fire regulations.

Important matters relating to fire and fire precautions are dealt with in this guide as follows:

- a) criminal damage by fire (see **1.4.5**);
- b) fire/emergency constraints on security (see **1.8**);
- c) windows as a means of escape (see **5.5.1**);
- d) emergency exit doors (see **6.20**, **7.2** and **7.6.2**);
- e) fire-resisting doors and shutters (see **7.3** and **8.6**);
- f) the need for pressure relief facilities in roofs or walls in buildings where materials are to be stored which can produce a flammable atmosphere (see also **10.1.3.3** and **10.2.1.3**);
- g) the need for the provision of means of venting smoke and products of combustion in the event of fire (see **10.1.3.2**, **10.2.1.2** and **10.4**);
- h) fire alarm systems (see **12.11**).

Other points that need to be taken into consideration are:

- 1) the possibility that especially flammable materials are to be stored;
- 2) the possibility that the sheer quantity of combustible materials stored may add to the magnitude of the fire risk;
- 3) the possibility of small quantities of incompatible materials adding to the fire risk;
- 4) the advisability, in some instances, of installing fire extinguishing systems, e.g. automatic sprinkler systems;
- 5) the provision of means of escape from buildings and the site in case of emergencies;
- 6) the provision of adequate entry facilities for the Fire Brigade in case of emergency;
- 7) the dangers to buildings or goods arising from a fire in parked vehicles or in waste.

3.7 Safety and health considerations

Security at the design stage is also influenced by consideration of safety and health. Points that need to be taken into consideration include the following:

- a) statutory requirements (see also **1.8**);
- b) the avoidance of toxic or possibly even lethal atmospheres arising when certain substances are stored;
- c) the avoidance of damage to personnel, the building and its contents arising from the storage of chemicals.

3.8 Insurance

Insurers' requirements will need to be established to ensure that they are satisfied.

Section 4. Selecting and adapting existing premises

INTRODUCTORY NOTE. It is recommended that existing premises are surveyed by an expert in industrial security prior to acceptance for use as an office or shop.

Detailed guidance is given on how to carry out such a survey. The object is to identify the following:

- a) existing security;*
- b) the additional security measures than can be easily provided, if needed;*
- c) the additional security measures than can only be provided with difficulty or at considerable cost;*
- d) the limitations, if any, on security due to the inherent nature of the site and/or buildings.*

4.1 Site and building appraisal

4.1.1 Overall assessment

Examination of a site and building viewed from the point of view of the criminal is the surest way of identifying potential weak spots in security and indicating what steps should be taken to eradicate them.

4.1.2 Choice

Other things being equal and where alternative premises are available, the one offering the best security should be chosen. The selection of an unsuitable site or building can be an open invitation to crime.

4.1.3 Neighbourhood crime level

The security measures needed will be influenced by the neighbourhood crime level. Advice should be obtained from the Crime Prevention Officer of the local Police when assessing existing site security in relation to what will be required.

4.1.4 Landscape features

Natural features of a site should be examined, as some landscape features help to deter crime; others facilitate it. Clear sight lines and an uncluttered design for both the exterior and interior of a building site can assist security surveillance, especially when coupled with good natural and artificial lighting.

4.1.5 Derelict land

Derelict land in run-down areas can form a base from which criminals can operate. Account may need to be taken of this.

4.2 External walls

4.2.1 Strength

The fabric of the walls, e.g. brickwork, cladding, should be commensurate with the security risk. Otherwise high investment in an inner wall/fence as a second line of defence supported by a comprehensive intruder alarm system may be needed.

4.2.2 Structural attack

Even when the walls appear to be sufficiently strong, the building fabric may be attacked by criminals if they can work for sufficient periods unobserved.

The only way of keeping such walls under adequate surveillance may be to install security lighting and to provide a 24 h manned service supported by a sophisticated intruder alarm system and CCTV.

Additional defences may be required inside the building; for example the provision of security cages or fencing supported by special intruder alarm facilities.

4.3 Windows

4.3.1 Construction and installation

The adequacy of construction, installation and condition of all windows should be checked (see 5.3).

4.3.2 Dry/wet rot

Wood windows and frames should be checked for dry/wet rot.

4.3.3 Fixed windows

Consideration should be given to the adequacy of glazing and the possible need for bars, grilles or shutters.

4.3.4 Openable windows

Locks and other hardware should be checked to ensure that they are of satisfactory types and in good condition.

Secure window limiters should be considered, where appropriate, for restricting the extent of opening of windows, except when the windows are needed for emergency egress.

See also 4.3.3

4.3.5 Display windows

The degree of security provided by the glazing should be checked. The need for shutters, grilles or collapsible gates should be considered.

See also 4.3.3.

4.4 Doors and shutters

4.4.1 Number of doors

Doors surplus to requirements and which present a security risk should be removed and the gaps filled in with bricks or other suitable material; always providing that they are not needed for emergency escape in accordance with the relevant enforcing authority's requirements.

4.4.2 Suitability and condition

External doors and shutters should be checked for suitability.

Doors and door frames should be examined for soundness. Shutters should be checked likewise. Wood doors should be examined to see that they are free from dry/wet rot.

Wood doors can be strengthened by steel sheet lining, provided that the hinges and door frames (jambs or mullions) can carry the additional weight.

4.4.3 Hinges

Hinges should be checked for suitability and adequacy of fixing (see also 6.14 and BS 7352).

4.4.4 Locks

Locks should conform to the recommendations in section 6. Existing locks should be changed to re-establish the lock integrity. Additional locks may be necessary.

4.4.5 High-risk situations

High-risk situations may necessitate the replacement of doors and frames in their entirety by high security steel doors and frames. Shutters may not be adequate and may need to be replaced.

4.4.6 Access control

The feasibility of installing electronic access control systems to certain critical external and internal doors and shutters should be established where appropriate.

Alternatively or additionally some entrances to buildings and rooms may need to be fitted with two doors separated by a short passage, possibly incorporating an alarm system. The ability to do this, where necessary, should be checked.

See also section 14.

4.5 Grilles and collapsible gates

Grilles and collapsible gates should be checked for soundness. See also 4.4.4 concerning locks.

4.6 Roofs

Roofs should be examined for structural weakness. The fabric of the roof should be commensurate with the security risk.

Roofs obscured from public view may be structurally attacked.

4.7 Other access points through roofs and walls

Access points through roofs and walls need examination for weaknesses. (See section 10.)

4.8 Perimeter security

The adequacy of site and building security needs to be considered. For example, recessed doorways should be avoided whenever possible.

4.9 Lighting

External and internal lighting used for security purposes should be assessed for adequacy and condition. (See section 11.)

4.10 Intruder detector and alarm systems

Existing intruder detector and alarm systems should be examined for adequacy and condition. (See section 12.)

4.11 Surveillance systems

Space may be needed for security staff to view closed circuit television (CCTV) and surveillance cameras. (See section 13.)

4.12 Telephone lines

Consideration should be given to the adequacy of protection of telephone lines and dedicated lines to central alarm stations. If inadequate, the practicability of improving the protection should be investigated. (See 12.10.)

4.13 Goods storage, reception and despatch areas

Goods storage, reception and despatch areas should be such that they can be made secure without interfering with operation requirements. (See 3.4.8.)

4.14 High-risk items

Facilities for housing especially valuable items and protection of information may be required. (See sections 15, 16 and 17.)

4.15 Hazardous goods and dangerous substances

There may be a need to cater for the secure storage of hazardous and dangerous substances.

4.16 Security staff

The suitability of the premises for the housing and operation of security staff may have to be considered. (See section 18.)

Section 5. Windows

INTRODUCTORY NOTE. Section 5 is concerned with securing:

- a) accessible openable and fixed windows used in offices and shops;*
- b) display windows in shops, which may exist in isolation, or which may form part of a shop entrance or arcade.*

Guidance is given on:

- 1) the nature of security risks (see 5.1);*
- 2) security measures (see 5.2);*
- 3) window materials and construction (see 5.3);*
- 4) converting openable windows to fixed windows (see 5.4);*
- 5) window bars and fixed grilles (see 5.5);*
- 6) locks and fastenings for openable windows (see 5.6);*
- 7) shutters, grilles and collapsible gates (see 5.7).*

Guidance is given on glazing materials for windows in section 9. Section 12 contains guidance on intruder alarms for windows.

5.1 Security risks

5.1.1 General

Air conditioned buildings usually have the advantage that all the windows are fixed lights except perhaps for the few that have to be openable in emergencies or have windows which are kept locked except when they are opened for cleaning. Care should be taken to ensure that they are re-locked after cleaning.

5.1.2 Offices

Offices range from small low rise buildings to large high rise blocks. Regardless of the size of the building, the security that should be provided by the windows will in some cases be no greater than in domestic buildings (see BS 8220-1). In other cases the security risk may be considerably greater and the recommendations of this Part of BS 8220 should apply.

5.1.3 Shops

The security risk to windows varies, depending on the type, use and location of the premises.

Two types of risk for shops may need to be considered:

- a) to the merchandise within the shop if entry can be gained through windows at ground level, particularly at the rear, or where there is access from decks or roofs to windows at upper floor levels, or to roof glazing;
- b) to the merchandise in display windows which may be at risk from smash and grab raids.

5.2 Security measures

The appropriate security measures for a particular window will depend on its type, use, location and the risk. For example, the security required for a display window in a shop will be influenced according to whether or not the merchandise should only be on view to the public during business hours.

Table 1 indicates security measures that should be considered. Some windows may require more than one security measure.

Table 1 also summarizes means of closing arcades and external passageways to shop entrance doors.

5.3 Window materials and construction

5.3.1 General

Materials used for window frames include wood, steel, aluminium alloy and various forms of plastics, sometimes in combination. The degree of security afforded by these materials is directly related to the design of a system of glazing and to the strength of the pre-formed sections. Frames should not be accessible externally and should not be capable of being sawn through.

As windows and subframes (except for complex commercial installations) are related to damp-proof courses it is recommended that lug fixing is used. Subframes are sometimes built in to the surrounding structure without direct or lug fixing. The quantity of fixings for subframes when required, should not be less than those recommended for the window fixing if of a similar type. The holding power of a fixing device is dependent on the integrity and strength of the base material to which it is to be applied. In all cases advice should be sought from experts.

The use of externally exposed hinges or pivot-fixing screws should preferably be avoided, but if they are used they should be of the non-removable type.

For window design related to the security of the glazing, see 9.3.

5.3.2 Timber frames

The quality of timber used in frames and sub-frames should be in accordance with BS 1186-1.

Species which require preservative treatment should be treated in accordance with BS 5589.

The quality of timber workmanship should conform to BS 1186-2. The use of externally exposed hinge or pivot-fixing screws should be avoided.

5.3.3 Steel windows

Steel windows should conform to BS 6510.

Table 1 — Security measures for windows, and arcade and passageway closures

Item	Security measures (see note 1)	Fitted I = Internally E = Externally
1. Fixed windows (offices and shops)	a) Attention to glazing b) Bars c) Fixed grilles d) Hinged shutters	— I I I/E
2. Openable windows (offices and shops)	a) Attention to glazing b) Convert to fixed windows c) Locks and fasteners d) Bars e) Hinged shutters	— — I I I/E
3. Display windows (shops)	a) Attention to glazing b) Roller grilles c) Collapsible grilles d) Hinged grilles e) Removable grilles f) Roller shutters g) Collapsible gates h) Hinged shutters i) Bars	— I/E I I I/E I/E E I/E I
4. Closure of arcades and external passageways to shop entrance doors	a) Roller grilles b) Roller shutters c) Collapsible gates	— — —
NOTE 1 Glazing is dealt with in section 9.		
NOTE 2 Increased security can be achieved by supplementing physical security with an intruder alarm system which includes detectors which alert when windows are tampered with.		

5.3.4 Aluminium alloy windows

Aluminium alloy windows should conform to BS 4873.

5.3.5 Plastics framed windows

The problems associated with the use of plastics are no less relevant for window design than those associated with other types of window framing material. The design of plastics frames for windows should therefore be assessed for security purposes as for other types of framing material.

Plastics windows made from PVCu extruded hollow profiles should conform to BS 7412.

5.3.6 Use of impact-resistant glazing

Whether or not windows are openable, consideration should be given to the need for the prevention of entry or theft as a result of breakage of glass. Reference should be made to section 9 for recommendations concerning impact-resistant glazing. Frames should be adequately fixed to the structure, should be of adequate strength and should have glazing rebates of suitable size as recommended by the supplier or manufacturer of the glazing material. The installation of the glazing should be in accordance with 9.2 to 9.5.

5.4 Fixed windows

5.4.1 Converting openable windows to fixed windows

Areas of openable windows are sometimes larger than are necessary to provide adequate ventilation. In these circumstances, some openable windows could be converted to fixed windows unless they are needed for other reasons, e.g. additional comfort, emergency egress or access for external window cleaning.

The normal way of fixing openable windows for security purposes is to use screws through the frames. It may be advisable to obtain specialist advice before doing this so as to avoid affecting other performance aspects of the window. For example the positioning of screws in thermal barrier aluminium alloy frames and in plastics frames can be critical.

5.4.2 Ventilation with fixed windows

Ventilation devices can be fitted into timber or metal sheets incorporated in the glazing frame, as an alternative to the provision of openable windows.

5.5 Fixed bars and grilles for openable and fixed windows (see also 1.8)

5.5.1 General

Security bars and grilles protecting windows can present serious obstacles to means of emergency exit. This has been evidenced by incidents in which multiple loss of life has occurred when people have been trapped behind barred windows; at best, rescues have only been possible after protracted operations to cut bars from the outside.

Enforcement authorities are conscious of these potential problems. In accordance with established practice they may refuse permission for the installing of bars or grilles; they may also be able to press for the removal of bars or grilles in situations likely to be prejudicial to the personal safety of occupants.

Windows can also provide convenient means of access for fire-fighting operations. When considering the installation of bars or grilles, potential losses from stealing should also be assessed in relation to possible fire damage. Consultation with the local fire authority before installing window bars or grilles is strongly recommended.

5.5.2 Bar security

When window bars are to be used, the following recommendations, together with those given in 5.5.3 to 5.5.5, should be recognized as the minimum for the upgrading of the level of physical security:

- a) use of solid steel bars of nominal size not less than 19 mm diameter or cross section (square section is stronger) at not more than 125 mm centres;
- b) provision of nominal size 50 mm × 10 mm steel cross ties, at intervals of not more than 450 mm.

NOTE Consideration should also be given to supplementing physical security with intruder alarm protection to establish that an attack on the window bars has taken place (see section 12).

5.5.3 Fixing bars to the structure

5.5.3.1 Method 1

Where possible, bars should be fitted internally and should be set back not less than 50 mm from the internal surface of the wall. Each window bar should be grouted into the masonry at both ends, to a minimum depth of 75 mm. When bars are longer than 600 mm, cross ties should be provided and should be welded at the intersections or otherwise made immovable.

Alternatively, the cross ties may be fitted separately into the masonry to a depth of at least 75 mm at each end and should be welded at intersections.

This method is most effective when used at the time of building construction, as installation at a later date may weaken brickwork and damage window lintels.

5.5.3.2 Method 2

When it is not possible to sink the individual bars into the masonry, they should be threaded through and should be welded to the cross ties. The ends of the cross ties should be split and spread to enable the unit to be keyed into the masonry at each side, and should be fixed with cement grouting.

5.5.3.3 Method 3

An assembly of bars and cross ties of appropriate size should be welded to an angle steel frame, drilled and fixed to the surrounding brickwork using expanded bolts or bolted to the framework of the building structure (see Figure 2).

5.5.4 Fixing bars to timber window frames

When fixing into the masonry is not practical, bars should be welded to a cross member at each end. The cross member should be drilled between each bar and secured to the woodwork with substantial coach bolts fitted with nuts and burred over. The external heads of the bolts can be sunk below the surface of the frame and can be covered with filler. The strength of such a unit depends on the fixing of the frame to the structure.

The arrangements of bars described in 5.5.3.3 can be fitted internally to timber frames in a similar manner.

5.5.5 Fixing bars to metal window frames

When fixing into the masonry is not practical, it is usually possible to secure bars to the window frames, but because of the variety of such frames in use, it is not possible to suggest a standard method of fixing. The strength of such an arrangement depends on the material and strength of the window framing and on the fixing of the window framing to the structure.

5.5.6 Bars and plastics window frames

Window bars should not be fixed to plastics windows, whether or not they have metal reinforced frames.

5.5.7 Roof glazing bars

When a security risk is deemed to exist, the provision of roof glazing should be avoided if possible. When roof glazing exists or has to be installed in situations where it is possible that intruders could gain access, lantern lights, roof lights and dome lights should be fitted with bars (see Figure 3) in accordance with 5.5.3, so as to obtain a reasonable degree of security. Exterior fittings should be robustly constructed with metal plate coverings, clutch head type screws, or similar fittings.

NOTE Other roof terminals such as ventilation shafts and ducting may also need to be secured against unauthorized entry.

5.5.8 Fixed grilles

Expanded metal grilles or welded mesh grilles screwed internally to the window frame or surrounding brickwork can provide effective window protection internally in that it is difficult to attack them with cutters. Even if the glazing is breached there is resistance to fishing through the grille.

The selection of mesh size and gauge should have regard to the degree of attack resistance required, and to the risk of fishing.

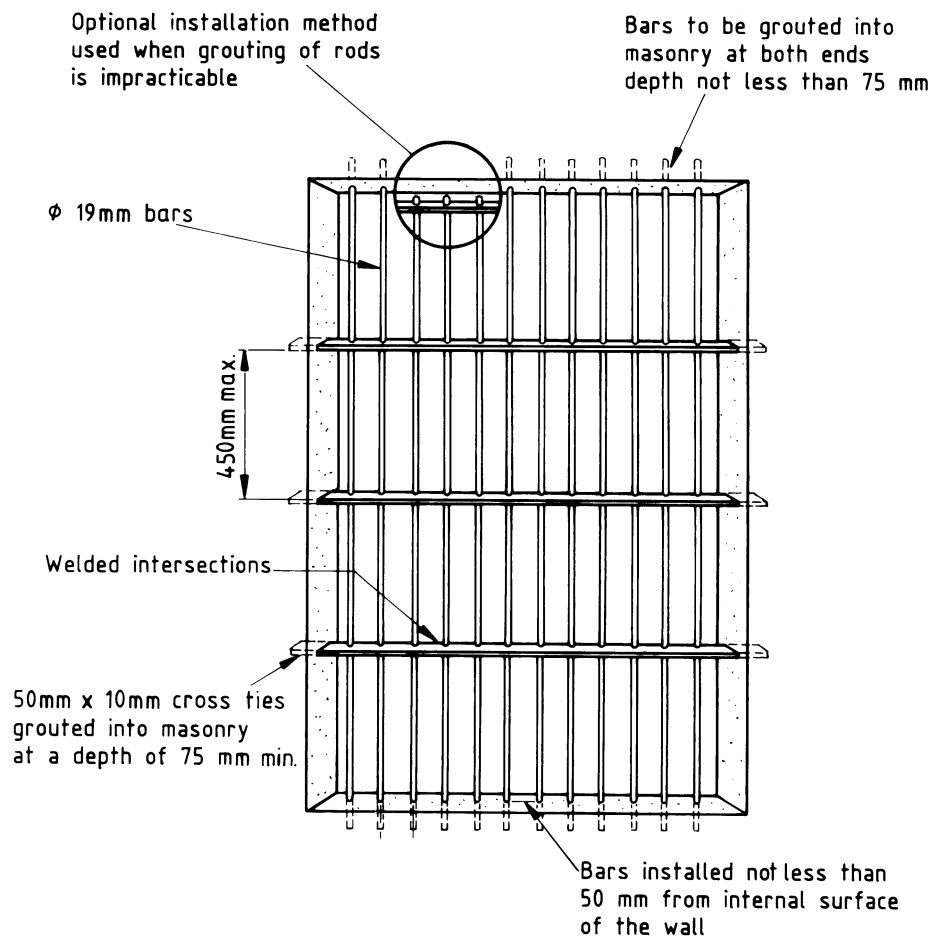


Figure 2 — Typical window bars (viewed from inside)

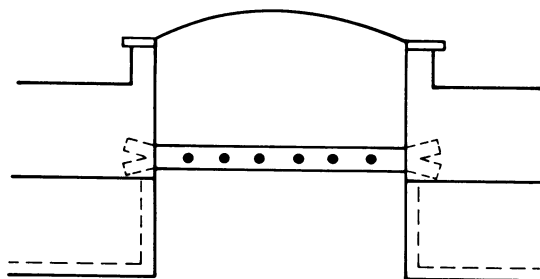


Figure 3 — Typical cross section of a roof grille showing how it is embedded into the building structure

5.6 Locks and fastenings for openable windows

5.6.1 General

When the security risk is not considered sufficient to justify the fitting of bars, grilles or shutters, or when these are inappropriate, protection can be provided against entry by breakage of glass to reach handles or other fittings of openable windows, by fitting lockable security fastenings to the opening windows. For these to be effective, the design and construction of the windows should conform to the recommendations of 5.3.

There is a considerable variety of window locking devices available and selection can be difficult. They have to be suitable for the type of opening window and for the construction of the frame. Selection will depend on the frame material, the design of the window and the degree of security required.

Many of the various types of locks and fastenings for hinged, pivoted and sliding windows are described and illustrated in BS 8220-1, where guidance is also given on their optimum positioning and on fitment precautions.

5.6.2 Specification of new and replacement windows

Openable windows for offices and shops are more likely to be purpose made than standard products. The number of openable windows should be restricted (see 5.4).

The need or otherwise for multi-locking fittings or key-operated locks should be considered at the design or construction stage or when windows are to be replaced, to reduce the possibility of frames having to be adapted to receive additional security items.

5.6.3 Locks and fastenings for existing windows

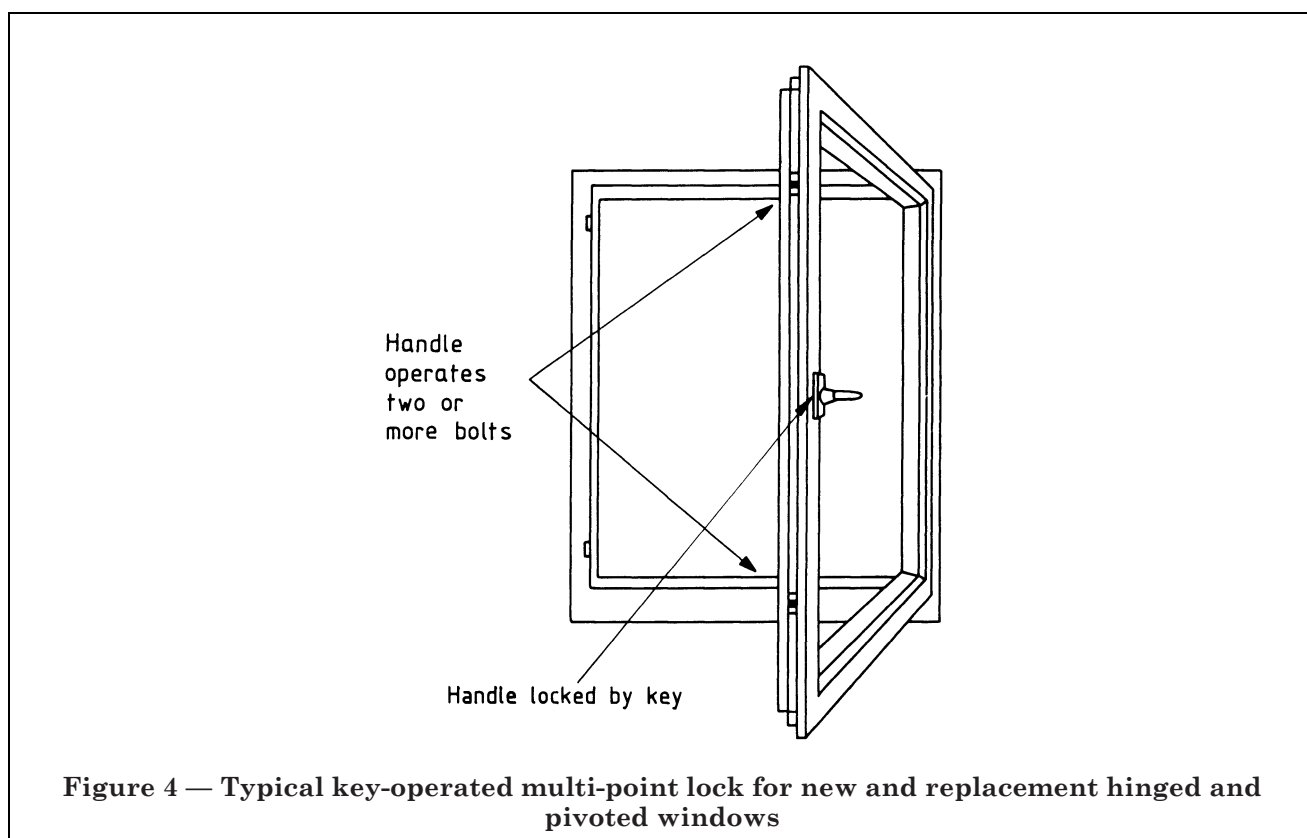
Before considering the fitting of security locks a check should be made regarding the need for all windows to be openable and whether it is more practical for some of them to be secured permanently (see 5.4).

There is a considerable variety of window locking devices available and selection can be difficult. They have to be suitable for the type of opening window and for the construction of the frame. Selection will also depend on the frame material.

Types of available locks and fastenings include the following:

- a) Locks integral with new and replacement windows:
 - 1) key-operated multi-point lock (see Figure 4);
 - 2) cockspur handle with cylinder lock.
- b) Independent locks to supplement existing fastenings:
 - 1) lock with turn button to secure the window with differ key to unlock;
 - 2) lock with push button to secure the window with common key to unlock;
 - 3) lock with common key to secure the window and unlock;
 - 4) internal casement lock for steel casement window with common key to secure and unlock.
- c) Devices for securing existing non-lockable fastenings:
 - 1) casement stay screw;
 - 2) casement stay stop with common key to secure and unlock;
 - 3) cockspur handle stop.

Exposed screws in existing windows should be replaced with non-removable screws, or the heads of screws should be defaced. External fixing bolts or external pins or bolts of pivots or hinges should be made secure by burring over or by similar means.



5.6.4 Common key and differ key locks

A burglar will need a much smaller bunch of keys to have a good chance of opening a window lock than will be needed to open a door lock. This is because many brands of window lock (sometimes all brands from a particular manufacturer) are made so as to be opened by the same (common) key; an entirely different situation from that obtaining with door locks which are manufactured with a large number of key variations (differs).

Some more sophisticated window locks are manufactured which offer a limited number of key variations. Such locks will clearly present greater difficulty than common key locks for intruders who break glass with the object of gaining access to a window lock.

5.6.5 Hinged and pivoted windows

There is a variety of locks and fastenings that will add to the security of hinged and pivoted windows.

Multi-point locks that form an integral part of the window design provide greater security than those used to supplement or secure existing non-lockable fastenings.

5.6.6 Sliding windows

5.6.6.1 General

The design of sliding windows and their fittings should be such that it is not possible for sashes or glass to be removed externally when the sashes are closed. Catches should not be capable of being manipulated from the outside.

5.6.6.2 *Vertically sliding sash windows*

Typical fastenings and locks for vertically sliding sash windows are:

- a) locking cam catch (Fitch catch) with cylinder lock;
- b) window locking stop;
- c) dual screws for use when the vertical members of upper sliding sashes are too narrow to accommodate locking window stops.

5.6.6.3 *Horizontally sliding windows*

The advice of the window manufacturer if known, or locksmith, should be sought when locks have to be fixed to horizontally sliding windows, as the designs of such windows vary considerably. Types of lock include the following:

- a) independent lock with key-operated bolt into the sliding sash and a common key to lock and unlock the window;
- b) locking cam catch.

5.6.7 Louvre windows

Louvre windows are considered to be a high security risk. Louvre windows should not be used in positions accessible from the outside, as entry through them can be made quietly and easily. Ideally, louvre windows should be replaced and some other means of ventilation, if necessary, should be provided (see 5.1.1) or bars should be fitted (see 5.5).

Externally exposed fixing screws should be replaced or defaced as described in 5.6.3.

NOTE Some louvre windows are claimed by their manufacturers to be less of a security risk, on account of particular design features incorporated in them. Expert advice should be sought on the suitability of such louvre windows when considering them for a particular site.

5.7 Protecting display windows: shutters, grilles and collapsible gates

5.7.1 General

Shop display windows can be protected in a variety of ways as indicated in Table 1, i.e. by roller shutters, by grilles of various types or by collapsible gates as well as by suitable glazing.

Roller shutters, roller grilles and collapsible gates can also provide protection for arcade entrances and external passageways to shop entrance doors.

5.7.2 Choice

The choice for a particular situation will be influenced by the following:

- a) the relative importance of protecting goods from being stolen or protecting window panes from vandal attack. In the first instance internally installed protection is clearly an advantage; in the second instance externally installed protection is preferable;
- b) the size of the windows to be protected and how they are located in relation to one another; a single shutter, grille or collapsible gate may sometimes be able to protect more than one window;
- c) the extent to which the protection is to form an integral part of other security measures such as security staff supervision, intruder alarm systems and the type of glazing;
- d) operation convenience;
- e) cost;
- f) acceptability to the planning authority.

The following points apply generally.

- 1) Tubular section bars are less secure than solid bars as they can be easily cut.
- 2) Aperture sizes will be influenced by the size of grilles and collapsible gates, the strength and design of the materials, the nature of the goods to be viewed and the position of the goods relative to the grilles or collapsible gates.
- 3) Particular care should be taken to ensure that external grilles and collapsible gates are adequately secured against removal.
- 4) The structure should be robust enough to take the fixings securely.

NOTE The introduction of obstacles such as raised flower beds at shop fronts may be useful for preventing the access of vehicles used for grappling and pulling out grilles and shutters.

The securing of typical roller shutters, grilles and collapsible gates is dealt with in detail as indicated below:

- i) roller shutters (8.7);
- ii) roller grilles (8.9);
- iii) collapsible grilles (8.10);
- iv) removable grilles (8.11);
- v) hinged grilles (8.12);
- vi) collapsible gates (8.13).

In some situations hinged shutters fitted externally may have application (8.14) for protecting shop display windows.

NOTE Ornamental grilles made of wrought iron or other materials may offer limited protection in addition to being decorative. The design of the grilles should, however, be such as not to create possible footholds which would enable them to be used in a manner equivalent to a vertical ladder.

Section 6. Locks and other security hardware for doors and shutters

INTRODUCTORY NOTE. A comprehensive range of locks, latches, padlocks, bolts and other security hardware is described and illustrated to cover the various needs for security doors, shutters, grilles and collapsible gates.

This British Standard recommends that there is an overall locking plan for all sites. The matters that need to be considered when drawing up such a plan are listed.

Guidance is given on lock quality, locking precautions, fastening of locks and other security hardware, key strategy (including the use of master key systems) and key security.

Precautions recommended to prevent locks being compromised during building operations are indicated.

Recommended arrangements for securing doors for emergency exit purposes are dealt with in detail.

Fastenings with general and particular applications are described and illustrated. See BS 5588 for emergency exit recommendations.

Various designs of electric locks and latches used in remotely controlled access control systems are described and illustrated. Precautions that need to be taken with electric locking to avoid emergency exit arrangements being compromised are indicated.

It is emphasized that some site locking arrangements require the approval of the relevant enforcing authority.

The effectiveness of any hardware/ironmongery is totally dependent on the quality of timber or other materials, the accurate fitting and strength of fixings within the door, frame and structure. Good quality hardware/ironmongery alone will not provide protection or security.

6.1 General

Various applications and types of doors and shutters require different locking devices and supporting hardware. Locking devices and hardware required for a particular door or shutter are also dependent on its use.

It is always desirable to consult locksmiths, architectural ironmongers, manufacturers or other security experts at an early stage about new locking systems and the efficacy of those already in existence.

The fastening requirements for a particular door or shutter are governed by:

- a) the construction material(s), which may be steel, wood, aluminium alloy, glass, PVCu etc.;
- b) the design which may be hinged or pivot-hung, (single or double swing), sliding, folding, sliding folding, up-and-over, roller or revolving etc.;
- c) the way that the door/shutter is opened and closed, i.e. by manual and/or electrical operation; electrical operation is needed for heavy doors or shutters or where remote operation is desired;
- d) the functions that the door/shutter has to perform in relation to general access and egress, emergency exit arrangements and operational requirements (see 6.2);
- e) the need for the shutter or door to be secure from the inside (see 6.2);
- f) the status of the building or room; whether it is occupied at all times during business hours or is only visited occasionally;
- g) the presence or absence of security staff outside and/or during business hours;
- h) any constraints on securing measures which may be imposed by the door/shutter being required to be fire-resistant;
- i) any interaction between the door/shutter locking and the intruder alarm system or other monitoring system;
- j) any constraints imposed by aesthetic or other considerations, including those imposed by local authorities;
- k) the key security arrangements.

Table 2, which is not fully comprehensive, provides guidance on the use of the locking devices and associated hardware described and illustrated in this section.

Table 2 — Typical uses for locks and other security hardware

Item	Typical uses
1. Mortice deadlocks with horizontally thrown rectangular bolts (6.4 and Figure 5)	Hinged and pivot-hung solid doors and other hinged and pivot-hung doors where the dimensions of stiles, rails and patches permit; some revolving doors
2. Swing (pivot) action mortice deadlocks with rectangular bolts to suit narrow stiles (6.5 and Figure 6)	Hinged and pivot-hung narrow stile doors and some other doors of this type where they may be more effective than mortice deadlocks with horizontally thrown rectangular bolts
3. Hookbolt mortice deadlocks (6.6 and Figure 7)	Sliding and folding doors, gates and shutters. Some hinged and pivot-hung doors
4. Automatic deadlocks and deadlocking night latches [6.7 and Figure 8a), Figure 8b), Figure 9a) and Figure 9b)] a) rim b) mortice	Final secured exit doors where slam locking is required. Wicket doors on shutters Doors where morticing would weaken them, or where the doors are of metal sheet, making it impracticable, as in a wicket gate Doors where there is sufficient strength and material to accept morticing
5. Multipoint deadlocks (6.8 and Figure 10)	Various versions to suit hinged, pivot-hung single and double leaf and sliding doors made from various materials
6. Barrier bolts (6.9 and Figure 11)	Providing higher security to hinged single leaf doors and up-and-over doors which are used intermittently. Primarily for single sided operation from inside
7. Surface mounted cylinder locks with long throw bolts [6.10 and Figure 12a)]	Roller shutters
8. Double throw surface mounted bolts [6.10 and Figure 12b)]	Up-and-over doors and roller shutters
9. Vertical throw surface mounted cylinder locks [6.10 and Figure 12c)]	Up-and-over doors
10. Padlocks (6.11) a) concealed shackle (Figure 13) b) close shackle (Figure 14)	With padlockable bars With padlockable bars and cross bars
11. Padlockable bolts (6.12 and Figure 15)	Applicable to pairs of doors, roller shutters, sliding folding and up-and-over doors
12. Lever action flush mounted door bolts (6.13 and Figure 16)	Securing edge of first closing leaf of hinged and pivot-hung double leaf doors
13. Heavy duty butt hinges [6.14 and Figure 17a)] Hinge bolts [6.14 and Figure 17b)] Hinges with security studs [6.14 and Figure 17c)]	Required for securing hinged doors Hinge bolts aid security where hinges may be exposed to attack Combined hinge and interlocking stud
14. Hinge reinforcement guards (6.15 and Figure 18)	Bracing of hinge fixings for door leaf and adjacent frame on timber doors
15. Metal strengthening bars for timber door frames (6.16 and Figure 19)	Protection of vertical sides of frame of hinged inward opening timber doors