

Guide for

Security of buildings against crime —

Part 1: Dwellings

UDC 69-759.8 + 654.924.3

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee (BDB/-) to Technical Committee BDB/4, upon which the following bodies were represented:

Association of County Councils	Incorporated Association of Architects and Surveyors
Association of Metropolitan Authorities	Institute of Building Control Officers
Brick Development Association	Institute of Clerks of Works of Great Britain Inc.
British Standards Society	Institution of Civil Engineers
Building Employers Confederation	Institution of Public Health Engineers
Chartered Institution of Building Services Engineers	Institution of Structural Engineers
Concrete Society	National Council of Building Materials Producers
Department of Education and Science	Royal Institute of British Architects
Department of the Environment (Building Research Establishment)	Royal Institution of Chartered Surveyors
Department of the Environment (Property Services Agency)	

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

Aluminium Window Association	Department of the Environment (Housing and Construction Industries)
Association of British Insurers	Flat Glass Manufacturers' Association
Association of Builders Hardware Manufacturers	Glass and Glazing Federation
Association of Burglary Insurance Surveyors	Guild of Architectural Ironmongers
British Hardware Federation	HM Customs and Excise
British Lock Manufacturers' Association	Home Office
British Retailers' Association	International Professional Security Association
British Security Industry Association	Master Locksmiths' Association
British Woodworking Federation	Metropolitan Police
Chief and Assistant Chief Fire Officers' Association	National Supervisory Council for Intruder Alarms Limited
Consumer Standards Advisory Committee of BSI	Steel Window Association

This British Standard, having been prepared under the direction of the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1986

© BSI 02-1999

The following BSI references relate to the work on this standard:
Committee reference BDB/4
Draft for comment 83/11612 DC

ISBN 0 580 15000 3

Amendments issued since publication

Amd. No.	Date of issue	Comments
5179	March 1986	Indicated by a sideline in the margin

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
Section 1. General guidance	
1.0 Introduction	1
1.1 Scope	1
1.2 Definitions	1
1.3 Opportunities for burglary and crime	1
1.4 Strategy	2
1.5 Constraints related to fire	2
1.6 Design of dwellings	2
1.7 Design and layout of estates	3
1.8 Improving the security of existing estates	4
1.9 Housing management	6
Section 2. Securing windows and rooflights	
2.1 General	7
2.2 Security risks	7
2.3 Converting opening windows to fixed windows	7
2.4 Guidance on window design	7
2.5 Guidance on securing opening windows and rooflights	8
2.6 Ventilation	14
2.7 Rooflights	15
2.8 Bars, grilles and security shutters	15
Section 3. Securing external doors	
3.1 General	16
3.2 Door security problems	16
3.3 Guidance on construction and installation of new external doors	17
3.4 Security locks and other security hardware	17
3.5 Recommended methods of securing external doors	24
3.6 Improving the security of existing doors	34
Section 4. Glass, plastics glazing sheet and glazing	
4.1 The security problem	36
4.2 Glass	36
4.3 Plastics glazing sheet material	36
4.4 Glazing	36
4.5 Windows as a means of escape	37
Section 5. Intruder alarm systems	
5.1 Installation and siting	38
5.2 Guidance on the installation and maintenance of intruder alarm systems	38
5.3 Intruder alarm and fire alarm signals	38
Appendix A Guidance for owners and occupiers	39
Index	43
Figure 1 — Typical hinged and pivoted windows (various framing materials)	9
Figure 2 — Typical independent locks that provide additional security by supplementing the existing lockable or non-lockable hardware for hinged or pivoted windows	10
Figure 3 — Typical devices used to secure non-lockable fastenings, for hinged and pivoted windows	11

	Page
Figure 4 — Typical key-operated fastenings supplied with windows or, where practical, fixed as replacements for the original hardware	12
Figure 5 — Locking cam catch (Fitch catch) with cylinder lock	12
Figure 6 — Typical independent fastenings and locks for wood framed vertical sliding sash windows	13
Figure 7 — Typical lock for horizontally sliding aluminium alloy sash windows	14
Figure 8 — Typical louvre window	14
Figure 9 — Typical window bars and grilles	15
Figure 10 — Typical weak external door	16
Figure 11 — Typical mortice deadlock	18
Figure 12 — Typical mortice sashlock	19
Figure 13 — Typical vulnerable rim night latch	19
Figure 14 — Typical rim automatic deadlock	20
Figure 15 — Typical mortice lockset for fire check entrance doors to individual flats	20
Figure 16 — Typical automatic mortice locking latch for communal exit doors to blocks of flats	21
Figure 17 — Typical door bolts	22
Figure 18 — Typical security padbars and concealed shackle padlocks	23
Figure 19 — Typical close shackle padlock and strong padbar	23
Figure 20 — Typical and vulnerable hasp and staple, open shackle padlock and padbar	24
Figure 21 — First line of defence: see the caller without opening the door	24
Figure 22 — Second line of defence against callers at the door: limited security when the door is partly open	25
Figure 23 — Typical fasteners for “second fit” securing of door frames to surrounding structure without the risk of spalling	25
Figure 24 — Typical secured wood front entrance door of a separate dwelling	26
Figure 25 — Typical secured wood front entrance door of an individual flat in a block of flats	27
Figure 26 — Typical secured side or rear entrance doors not used as final exit doors	28
Figure 27 — Typical secured outward opening doors	29
Figure 28 — Typical double leaf hinged wood doors	30
Figure 29 — Plan view of meeting stiles of typical double leaf hinged steel doors, showing one of the two flush bolts concealed within the channel of the first closing leaf	30
Figure 30 — Typical outward opening double leaf steel doors fitted with a locking espagnolette (key action not shown)	31
Figure 31 — Typical sliding patio doors: conventional primary and secondary methods of locking	32
Figure 32 — Alternative method of secondary locking of patio doors	33
Figure 33 — Securing a typical up and over garage door with mortice locks or padlocks	34
Figure 34 — Typical double leaf hinged wood doors secured with a locking espagnolette	35
Table 1 — Securing existing doors	35
Publications referred to	Inside back cover

Foreword

This Part of BS 8220, prepared under the direction of the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee, is concerned with the security of dwellings. Further Parts dealing with other types of buildings will be issued in due course.

This Part was prepared at the request of the Home Office who asked for priority to be given to dwellings because crime statistics showed that dwellings were the most important group of buildings needing “British Standard” guidance on security.

The term “dwelling” as used in this Part does not include residential buildings categorized as being within the purpose group “Institutional” by the Building Regulations. These buildings will be covered in a later Part of BS 8220.

This standard has been so prepared that it can be understood and used by residents as well as by architects, builders, designers, housing managers, manufacturers and specialists.

The security of both new and existing dwellings is covered in this Part of BS 8220.

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 iv, pages 1 to 44, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General guidance

1.0 Introduction

1.0.1 Opportunities for crime

It should be noted that the word “security” in this guide refers to measures aimed at reducing the opportunity for crime and making crime more difficult to commit.

This Part of BS 8220 gives guidance and makes recommendations about the ways in which measures can be taken to reduce the number of burglaries and other crimes in relation to dwellings. Such actions should reduce the distress and loss suffered by victims. The burden on the police and law courts will also be reduced.

Many burglaries and other crimes relating to dwellings are committed by persons who have been given easy opportunities to commit crime. The most basic levels of security can deter such persons and are likely to delay even determined intruders.

Often there will be no single clear cut answer to a security problem, because many of the factors involved in the assessment of the risk are themselves known imprecisely.

1.0.2 Fire, emergency and other constraints on security

Practical experience is invaluable in order to arrive at reasonably reliable assessments of risk, taking due account of the overall constraints on the security provisions likely to be acceptable. For example, judgement is needed when assessing security measures that will be sufficient but that will not be over-costly or likely to affect, adversely, the normal quality of life (amenity) within a dwelling. Judgement will also be needed when external doors and windows are to be used for fire and emergency exit purposes.

1.0.3 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 and residents. They welcome liaison with architects and planners on the security aspects of building, relevant to design considerations.

Insurance companies will offer advice concerning the assessment of “risk” inherent in particular properties.

Manufacturers, locksmiths, other suppliers of hardware, builders and trade organizations have important contributions to make in their particular fields.

Advice can be obtained from a fire prevention officer of the local fire authority when fire protection is involved as well as security.

1.1 Scope

This Part of BS 8220 contains guidance on security measures aimed at deterring burglars from entering dwellings, and at helping to prevent criminal damage to dwellings, whether new or existing and whether single or multiple units. Putting into effect the recommended precautions against burglary will often reduce the incidence of criminal damage.

Recommendations are given for the securing of windows and external doors, for glazing, intruder alarm systems, external lighting and the controlling of access to multiple dwelling blocks.

Guidance is provided for architects, builders, designers, housing managers, manufacturers and specialists.

Appendix A has been specially written for owners and occupiers, and for those giving advice to owners and occupiers.

NOTE The titles of the publications referred to in this standard are listed on page 45.

1.2 Definitions

For the purposes of this Part of BS 8220, the definitions given in BS 6100 apply.

1.3 Opportunities for burglary and crime

Burglars are interested in dwellings where access is easy and where the contents are valuable. Some dwellings are therefore more at risk than others. Dwellings that appear to be unoccupied are more at risk than dwellings that appear to be occupied.

Accessible windows and external doors that are at the rear of dwellings and that are out of sight of neighbours and passers-by in the street are especially vulnerable. Ground floor windows and windows accessible from balconies, walkways and adjacent roofs are more vulnerable than upper level windows that are beyond normal reach.

Openable windows and doors are used as entry points. Burglars endeavour to gain quick entry with the minimum of effort and noise. Crime statistics indicate that the highest proportion of illegal means of entry is through windows.

Burglars normally enter dwellings in one of the following ways:

- a) through accessible windows or doors that have been left open or unlocked;
- b) by gaining access to window fastenings and door latches by breaking adjacent glazed panels;

- c) by forcing doors that are insufficiently strong to resist bodily pressure;
- d) by forcing weak locks;
- e) by overcoming night latches using stiff plastics card;
- f) by levering doors and windows open.

1.4 Strategy

The overall strategy for combating all burglary should encompass the following:

- a) paying attention to environmental design features to prevent intruders getting near accessible windows and external doors;
- b) securing and maintaining windows and external doors to make intrusion through them difficult;
- c) ensuring that the appropriate secure devices are fitted and are regularly used by all residents;
- d) taking steps to limit the extent of theft and damage to property if an intruder does gain access;
- e) keeping records of and marking valuable items of property to assist recovery if such items are stolen; marking may also act as a deterrent to theft.

1.5 Constraints related to fire

1.5.1 General

Keys for doors that afford means of escape should be readily and immediately available to occupiers, but should not be left in locks.

Care should be taken to ensure that fire resistance and effectiveness of fire doors is not impaired when security devices are fitted. Statutory requirements necessitate the provision of fire doors in situations such as those where there is direct access between any garage and a dwelling, and where entry doors to flats provide access from common areas.

Reference should be made to BS 5588-1.1, which gives guidance regarding the provision of means of escape in single-family dwelling houses.

Advice, when necessary, can be obtained from the fire prevention office of the local fire authority.

1.5.2 Fire safety of multiple dwelling blocks

Flats and maisonettes in blocks over two storeys in height will need careful consideration with regard to fire precautionary recommendations so that occupants will be protected from fire and smoke and will be able to escape to a place of safety.

Whatever security measures are ultimately adopted it is important that the fire safety requirements of CP 3:Chapter IV-1¹⁾ are met. This code deals with the planning of blocks of flats and maisonettes and of individual dwellings above the first floor in blocks of any height, and makes detailed design recommendations.

Entrance doors may be required under the Building Regulations to be self-closing and fire-resisting. There will be a risk, if a self-locking latch is fitted to an entrance door, of the door becoming accidentally locked during a fire, when one of the occupants of the dwelling is raising the alarm outside the dwelling.

Suitable locking devices are described in 3.5.3.3.

1.6 Design of dwellings

1.6.1 Role of designers

There are many existing dwellings where security should be improved, but it is clearly better that the protection of dwellings against illegal entry, and a reduction of the potential for crime generally in and around single dwellings and estates, should be considered at the design stages rather than as an afterthought. This procedure is also likely to be more cost effective.

Those concerned with building design should make contact at an early stage with the Crime Prevention Officer of the local Police.

1.6.2 Security problems

Security problems in general are described in 1.3.

1.6.3 Security in relation to other design criteria

The design of a dwelling is primarily concerned with its function. The design does, however, have to take account of other needs such as fire protection (see 1.5) and the security protection of residents against intruders.

In arriving at the recommendations for the security of accessible windows and external doors full account has been taken of the need for residents to be protected from fire. The recommendations concerning security have been adjusted to be compatible with other emergency exit needs.

The recommendations also take into account the need for certain windows to be kept continuously open to provide ventilation.

¹⁾ Work has commenced in BSI upon the drafting of a Section of Part 1 of BS 5588 regarding flats and maisonettes, which will replace CP 3:Chapter IV-1:1971.

1.6.4 Accessible windows

Specific recommendations for the securing of different kinds of accessible windows are given in section 2. Information on ventilators is given in 2.6. Information on glass and glazing is contained in section 4.

1.6.5 External doors

Specific recommendations for the securing of front entrance doors, rear and side entrance doors, double leaf hinged doors, garage doors and shed and outbuilding doors are contained in section 3. Information on glass and glazing for panels is in section 4.

1.6.6 External lighting

Allowance should be made in electric wiring systems for the possible need for external lights, whenever entrances to dwellings and garages are not clearly illuminated by street lighting. See also 1.8.7.

1.6.7 External features

External claddings and sheeting should be of sufficient strength to delay unauthorized access as a result of breakage. This applies particularly to the design and construction of extensions.

Rainwater, soil and waste pipes, even if made of lightweight materials, can be used to reach flat roofs and upper windows, and so far as is practicable should be inaccessible to intruders.

Complex building forms, and terraces or walls close to buildings, can also be an aid to unauthorized access. When it is not possible to avoid the risk by design, the specification of anti-scaling barriers should be considered.

1.6.8 Storage

Delivery hatches and dustbin compartments should be designed and located so as to deny, from outside dwellings, both bodily access and access to door and window controls.

Stored tools and equipment can be used by potential intruders to commit burglary or raise fires.

Provision should be made for tools and equipment to be stored securely. The security provision for such storage in outbuildings should be the same as for garages.

Rooms or cupboards used for the communal storage within blocks of flats of such items as cleaning appliances and materials should be fitted with robust doors secured with thief resistant locks in accordance with the recommendations of 3.4.2.1.

Provision should be made for the storage of service ladders. When these have to be stored outdoors they should be secured by padlocking to an immovable object.

1.6.9 Lifts

Lifts should be located within secure or supervised entrance halls. Lifts in multi-storey blocks in some areas are subject to vandalism, and specialist advice should be taken concerning measures needed to combat graffiti and damage to control panels.

1.6.10 Electricity and gas meters

Credit meters in single dwellings should be so positioned that they can, whenever possible, be seen by meter readers without access into the dwellings being necessary. Credit meters in blocks of flats can be grouped in a common access area and be covered with vandal resistant materials. Such installations should not be fitted in situations where they might provide a step or platform from which a criminal could work.

Coin-operated prepayment meters can constitute a security risk and due note should be taken of this fact when they are installed. Access to them should be from within dwellings only, and they should be concealed.

1.7 Design and layout of estates

1.7.1 Housing estates and multiple dwelling blocks

Housing estates and multiple dwelling blocks offer additional security risks.

Communal entrance halls and access areas can be concealed from the street or from public view and so afford criminals the opportunity to operate unseen. These areas can also be subject to vandalism so that it may be difficult to maintain security measures in good working order.

Extensive footpaths and walkways on estates can also provide opportunities for personal assaults and robberies. Even if this risk is small in practice, such layout features can induce fear and anxiety among residents.

Garage areas are often subject to vandalism and offer the opportunity for theft of and from cars.

1.7.2 General measures

The security of dwelling units, whether individual houses on an estate, or flats or maisonettes, is as dependent on their immediate environment and siting relative to one another, as it is on their individual security arrangements. Whilst the provision of individual security measures can, given proper guidance, be readily arranged and maintained by the residents the tenor of the surroundings can often be beyond their control. These areas should be given particular attention at the design stage, or when estate improvements are being considered.

The aim should be to provide an environment that is secure, but which is also congenial and which induces pride in and respect for buildings and the surroundings. As a general principle, space in communal areas, whether inside blocks of flats or around groups of dwellings, should have its purpose defined and allocated, so that residents may supervise and exercise some control over their environment. Layouts should not be too secluded. For example, it is helpful if allowance is made for some natural supervision of outside areas from the windows of dwellings. Some control or surveillance of communal entrance halls to blocks of flats is also desirable (see 1.8.8).

The Crime Prevention Officer of the local Police should be consulted at an early stage, so that security measures appropriate to the likelihood of crime in the neighbourhood can be incorporated in the estate layout.

1.7.3 Footpaths and estate roads

On estates designed to low densities, and especially where access for pedestrians and vehicles is separated, care should be taken to ensure that footpaths and estate roads that pass through walled areas, tunnels, round corners or through courtyards do not create places of concealment with the potential for criminal activities.

When buildings are at higher densities, access ways may have to be complex. Whether at ground level or above, these should be made as short and straightforward as practicable. This will also facilitate the emergency escape of residents.

1.7.4 Fences and walls

Residents' natural desire for a degree of privacy often leads to the provision of substantial fences and walls which present a physical deterrent to intruders and prevent quick and easy access to and between gardens. An enclosed garden or shrub planting between public access ways and the windows of ground floor dwellings affords some protection against casual attack on such windows, and will usually give better security than a totally open layout. The provision of substantial screening can, however, result in the formation of potential observation points or hiding places for intruders.

1.7.5 Planting

Care should be taken in the choice and placing of shrubs. Foliage should not be so dense as to afford an observation point or hiding place for a thief or attacker. Thorny species of shrubs may be a mild deterrent to such uses, and can also be effective as barriers to trespassers.

1.7.6 Garages

Garage areas located at a distance from dwellings should, if possible, be placed with their doors within view of residents and road users, in order to reduce the risk of criminal damage to the buildings or to vehicles and other contents.

1.7.7 Parking areas

Parking areas should be located within view of residents and road users. Excessive use of screening around parking areas is conducive to crime and vandalism and should be avoided.

1.7.8 External lighting

Darkness and concealment are aids to crime. Lighting alone will not protect dwellings from a determined criminal, but good exterior lighting in housing areas will help to deter crime and to reduce residents' fear of crime. See also 1.8.7.

1.7.9 Access to estates

In some situations, most commonly in the inner cities, open public access through housing estates increases the security risk to residents and their homes. In most cases, entrances and public ways through estates should be kept to a minimum. See also 1.8.8.1.

1.7.10 Access to multiple dwelling blocks

Communal entrances to blocks of dwellings should always be controlled, either mechanically or by personal surveillance. Measures used should be chosen according to local circumstances. See 1.8.8 for recommendations concerning access control systems.

1.8 Improving the security of existing estates

1.8.1 Local authority, housing association and high density housing

Flats and maisonettes form over 40 % of local authority housing in the UK and the percentage is higher in the major cities where the risk and fear of crime are known to be more severe.

1.8.2 Problems identified

In 1981²⁾ some of the problems on local authority, housing association and high density housing estates were listed as:

- a) poor design of dwellings or estates;
- b) unsuitable doors, locks, window fastenings and other hardware;
- c) inadequate levels of caretaking and policing;
- d) feelings of isolation and of being surrounded by strangers;

²⁾ Housing Services Advisory Group, Department of the Environment. *Security on Council Estates*. 1981.

- e) being unable to control events outside the dwelling;
- f) the perception that opportunities abound for crime to take place.

1.8.3 Security measures specific to existing housing estates

When such problems as those outlined in 1.8.2 exist, physical security measures alone will be ineffective and will need to be combined with improved staffing, maintenance and management services (see 1.9).

The security of individual dwellings is important, but consideration should also be given to improving the security of blocks of dwellings, communal entrances, access ways and open spaces.

The Crime Prevention Officer of the local Police, the residents and managing authority should be consulted. Technical and management improvements need to be coordinated.

1.8.4 Improving the layout

The measures for laying out new estates (see 1.7) should be applied, whenever practicable, to existing estates to improve security.

1.8.5 Improving the security of dwellings

The security measures recommended for new dwellings (see 1.6) should be applied to existing dwellings whenever practicable.

1.8.6 Accessible windows, external doors and glazing

Sections 2 and 3 contain comprehensive information on how to improve the security of existing accessible windows and external doors. Section 4 contains information on the strength of glazing materials.

1.8.7 External lighting

1.8.7.1 General. Good lighting will help to improve the security of an estate. See also 1.7.3 and 1.7.8.

In any attempt to upgrade estate lighting it is essential that the support and cooperation of residents should be sought, with regard to the quick reporting of lamp failure or damage to lighting equipment.

Existing lighting provisions should be reviewed regularly, as they can be or can become inadequate for various reasons including outdated installations, poor maintenance, vandalism, or the overgrowth of plants. Care should be taken to ensure that areas of shadow are not created. Levels of illumination, lighting time controls and fittings should be checked regularly, preferably after dark.

To be effective as a deterrent to crime, lighting will normally need to be kept on throughout the hours of darkness.

Fittings and controls should be designed and sited to avoid unauthorized access and malicious damage, should be of vandal resistant materials and should be maintained regularly.

Further information on security lighting is given in *The Essentials of Security Lighting*, 1981 reference EC 4131³⁾.

1.8.7.2 Multiple dwelling blocks. Communal entrances and access ways to blocks of flats should be designed without recesses or angles that can harbour intruders. When such features are unavoidable they should be well lit. Throughout the hours of darkness, entrances, staircases and access ways should have good and constant lighting. In blocks where it is not essential to keep full lighting burning continuously, there should nevertheless be sufficient constant illumination to deter vandals and reveal loiterers.

1.8.7.3 Floodlights. The use of carefully sited floodlights can prove effective for multi-storey blocks or for estates, and such lighting installations can be designed to add to the amenities of an area. Security lighting does not have to have a grim and industrial appearance; for example, lighting of building faces and open areas of trees and gardens can be highly decorative as well as improving security.

1.8.8 Access control

1.8.8.1 General. Casual access into estates and into buildings on estates will generally need to be limited or controlled. For example site entrances may need to be gated or restricted and traffic may need to be slowed with textured road surfaces.

1.8.8.2 Access control measures for large blocks of flats and maisonettes. Access to large blocks of flats and maisonettes should be controlled.

Entry control can be achieved by "phone entry systems", i.e. remotely operated locks and two-way speech communicators, or by closed circuit television, or by personal surveillance by resident porters, wardens or caretakers. Sometimes a combination of these measures is desirable.

Good design and management of entry control systems is essential. The provision of a quick response maintenance service to rectify faults is also most important.

The satisfactory functioning of an entry control system is dependent on the conviction of the residents that it is needed. Instruction and assistance should be given to residents to help them to operate the system.

³⁾ Available from the Electricity Council, 30 Millbank, London SW1P 4RD.

Residents should take care not to allow entry by unauthorized persons whilst themselves entering or leaving a building, and should request authorized visitors to do the same.

The number of entrances and exits should be kept to the minimum compatible with fire safety, and every entrance and exit should be equally secure. In practice, this means that blocks of dwellings or groups of dwellings within blocks should have a single entrance, with an additional fire escape exit openable only from inside the building. Main entrances of existing blocks of dwellings may need to be redesigned, and access for groups of dwellings in complex blocks may need to be so rearranged that a single controlled entrance is provided for each group of dwellings. Additional lifts and stairs may sometimes have to be provided. The main entrance should be obvious, attractive and well lit, and should afford no concealment for vandals or intruders.

When an entrance is controlled, other exits should not be capable of being used casually and left open.

1.8.8.3 Entry control systems. Phone entry systems can be provided for any design and size of block. Such systems should be very carefully considered and specified, as all the components of a secure entrance should be resistant to vandalism while being easy to operate for children, elderly people, tradesmen and visitors.

Residents can be provided with plastics identity cards or triggers that activate electronic sensors to open doors.

Further information on phone entry systems is given in *Security in Housing Blocks, Phone Entry Systems, A Design Guide*, 1982⁴⁾.

1.8.9 Lifts

Lifts are discussed in **1.6.9**.

1.8.10 Electricity and gas meters

Electricity and gas meters are discussed in **1.6.10**.

1.9 Housing management⁵⁾

1.9.1 General

Total reliance should not be placed on physical security measures. Good management of blocks of dwellings, and of housing areas or estates, can make an important contribution to their security. When management is good, buildings and their surroundings and physical security measures are all well maintained. When there is no litter or dereliction, opportunities for casual crime are likely to be reduced.

1.9.2 Locally based management

Initiatives on a variety of housing estates where crime and fear of crime had been among the problems identified (see **1.8.2**) have begun to show that the provision of a local housing office with readily accessible staff can often effect an improvement. To be effective in this way, staff within such offices have to be able to deal with a wide range of problems, to liaise with the local Police, and to encourage the reporting of and action upon local crime. A local housing office can relet empty property quickly, ensure that repairs are carried out and provide a quick response to complaints and estate problems. As a result, squatting and criminal behaviour are likely to be reduced.

1.9.3 Maintenance of security measures

The effective maintenance of security measures is as essential as their original provision.

An effective complement of caretakers, cleaners or porters is recommended for housing estates, to ensure a clean and well maintained environment, and to increase the natural supervision of the area. To maintain the necessary standard of upkeep it is essential that faulty or damaged items should be repaired or replaced quickly, as disrepair may invite further damage.

⁴⁾ Published by the Greater London Council, Department of Architecture and Civic Design, Technical Policy Division.

⁵⁾ For further information see Power, Anne *Local Housing Management, A Priority Estates Project Survey*; Department of the Environment, 1984.

Section 2. Securing windows and rooflights

2.1 General

This section deals with ways of securing windows to deter intruders from entering dwellings.

The nature of the security problems is described in 2.2 which refers to ways intruders exploit weaknesses in windows or fastenings. The conversion of opening windows to fixed windows is dealt with in 2.3.

Guidance is then given on the selection of materials for window frames (see 2.4) and the selection and fitting of locks and fastenings for opening windows (see 2.5).

Later clauses give guidance on:

- a) the effect on security of the need for continuous ventilation (see 2.6);
- b) rooflights (see 2.7);
- c) bars, grilles and security shutters (see 2.8);
- d) glass and glazing (see 4.1 to 4.5).

2.2 Security risks

The extent of security risk inherent in a window varies according to the window position. Windows particularly at risk are those at the rear of dwellings, at ground floor level, or where access is possible from balconies, decks or roofs of adjacent single storey structures. The value of most security measures is compromised, to some extent, by the fact that access can be gained by breaking glass. However, when panes are large, the act of breaking them can cause sufficient noise to attract attention. Other means of gaining entry will usually be tried and glass will only be broken as a last resort. It is unusual for entry to be made through a broken pane: more usually glass is broken to reach handles or fittings.

Fixed windows are more secure than opening windows.

2.3 Converting opening windows to fixed windows

Areas of opening windows are sometimes larger than are necessary to provide ventilation requirements stated in the Building Regulations. In these circumstances some opening windows could be converted to fixed windows unless they are needed for other reasons, e.g. ventilation for household comfort, fire escape purposes or access for external window cleaning.

The normal way of fixing opening 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.

2.4 Guidance on window design

2.4.1 General

Materials used for window frames include wood, steel, aluminium alloy and various forms of plastics⁶⁾, 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 formed sections.

The design strength of the formed sections for opening windows should be such that lockable security fastenings can be fitted securely.

Windows and their subframes should be securely fixed within the surrounding structure.

2.4.2 Wood frames

The quality of timber used in timber frames and subframes should be in accordance with the recommendations of Appendices B and C of BS 1186-1:1986.

There are of course factors other than security that have to be taken into account when the species of timber for a window is selected, e.g. suitability for external and internal use, the possible need for the timber to be treated with preservative and its suitability for sills.

The quality of timber workmanship should comply with the requirements of BS 1186-2. The use of externally exposed hinge or pivot fixing screws should be avoided.

2.4.3 Steel windows

Steel windows should comply with the requirements of BS 6510. The use of externally exposed hinge or pivot fixing screws should be avoided.

2.4.4 Aluminium alloy windows

Aluminium alloy windows should comply with the requirements of BS 4873.

⁶⁾ Work is commencing upon the drafting of a British Standard specification concerning plastics windows.

2.5 Guidance on securing opening windows and rooflights

2.5.1 General

Opening windows that are considered to be a security risk should be fitted with lockable security fastenings, which should preferably be ordered with the windows but can be supplied separately for fitting to existing windows. Such fastenings will reduce the possibility of them being opened by hand, through broken glass or by manipulation with a simple tool. Security fastenings should be easy to use with keys kept readily available for residents, but not accessible or visible to burglars.

The design of sliding windows and associated fittings should be such that it is not possible for sashes or glass to be removed externally when the sashes are closed.

When selecting security fastenings it should be remembered that some windows may be needed as alternative fire exits.

At the constructional design stage or when windows are to be replaced, an assessment should be made of the standard of security needed. The availability of suitable window locks and fastenings should be checked with suppliers.

External hinge pins or bolts or pivots should be made secure by burring over or by similar means. Whenever possible, the use of externally exposed hinge or pivot fixing screws should be avoided. If they are used they should be of the non-removable type. When existing windows have exposed ordinary screws for this purpose, the screws should be replaced with non-returnable screws, or the heads of the screws should be defaced.

2.5.2 Common key and differ key locks

Some locks operate with a common key throughout their manufactured ranges. It should be noted however that there is a variety of patterns of locks so that an intruder would need to carry many keys to be sure of being able to release one of these locks.

Other locks offer a limited number of “differs” or key variations. A differ key lock will present a greater problem than a common key lock, to an intruder who breaks a pane of glass and gains access to a lock.

2.5.3 Guidance on fitting and selection of security locks for windows

Locks are generally fixed to frames with wood screws, self-tapping screws or machine screws. In all cases care should be taken that the ends of screws do not contact glass when they are driven home fully.

In the case of plastics window frames the advice of the window supplier is necessary because the screws should pass through two walls of the framing to obtain a secure fixing, or be driven into the metal reinforcement if this is of aluminium alloy. Galvanized steel reinforcement should not be pierced.

Specialist advice should be sought before locks are fixed to aluminium alloy and plastics frames.

As an alternative to fitting security locks to supplement conventional fastenings it may be appropriate to replace the original fastenings with key-lockable versions. Whether this is practicable depends on the availability of suitable replacement types and the method of fixing of the original fastenings, which may have been with screws, bolts and nuts, or rivets.

The selection of locks to suit a particular window frame can be difficult, because of the wide variety of locking devices available and because of the wide variety of window frame materials and designs. To assist the cross-referencing of text with the associated illustrations of typical locking devices, the guidance has been set out in 2.5.4 to 2.5.7 dealing in turn with the following categories of window design:

- a) hinged and pivoted windows;
- b) vertically sliding (sash) windows;
- c) horizontally sliding windows;
- d) louvre windows.

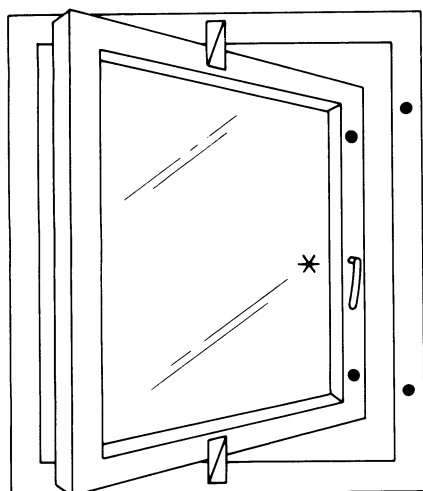
Even within these four categories of window design the practicability of fitting a particular lock will depend on the precise cross section of the fixed and moving frames at the point where the lock is to be sited. A rough, but dimensioned, sketch will often aid decision taking.

2.5.4 Hinged and pivoted windows

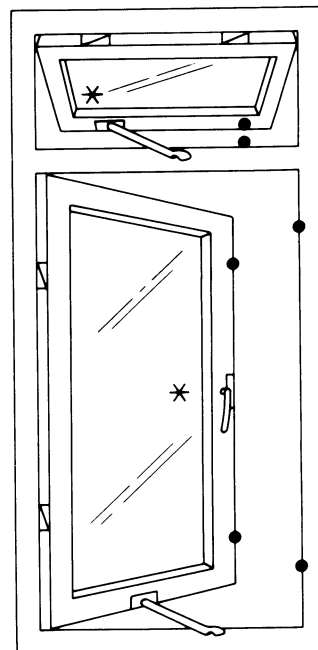
2.5.4.1 Types of hinged and pivoted windows. Four types of hinged and pivoted windows are illustrated in Figure 1:

- a) vertically pivoted [Figure 1(a)];
- b) side hung casement and top hung window [Figure 1(b)];
- c) horizontally pivoted [Figure 1(c)];
- d) bottom hung windows [Figure 1(d) and Figure 1(e)].

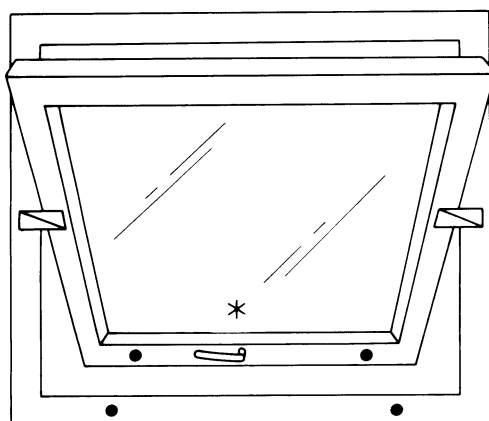
Typical positions of original fitments are shown, together with the recommended positions for additional independent security locks when necessary. Note that in the case of the bottom hung windows, the originally fitted window limiters or scissor-stays can often deter intruders.



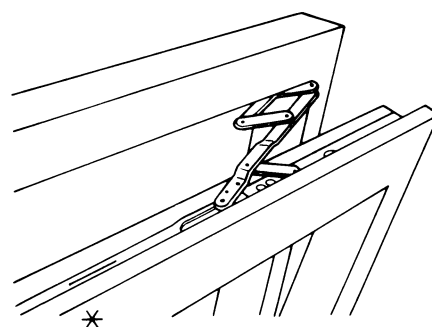
(a) Vertically pivoted.



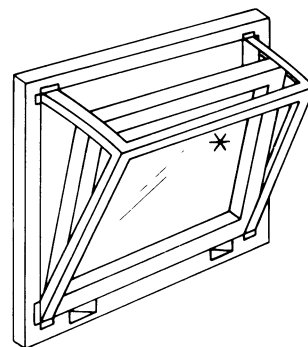
(b) Side hung casement with fanlight.



(c) Horizontally pivoted.



(d) Concealed scissor action stay on bottom hung casement window.



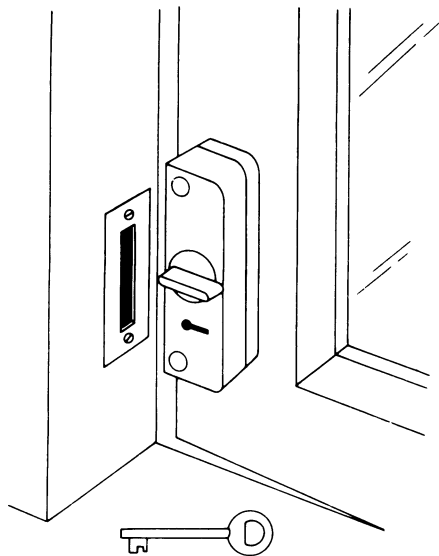
(e) Fixed window limiter on bottom hung window.

Key to symbols

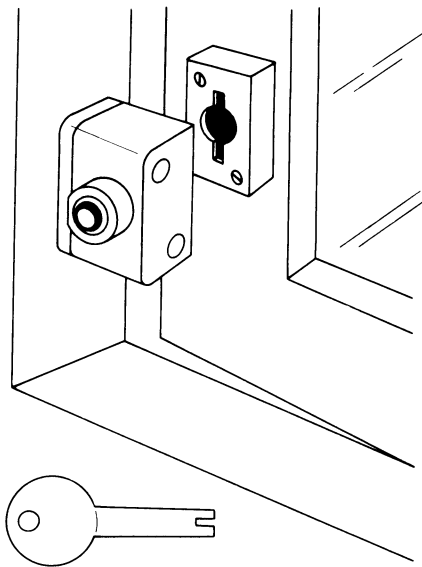
 Hinge or pivot

 Location of original cockspur or staylock

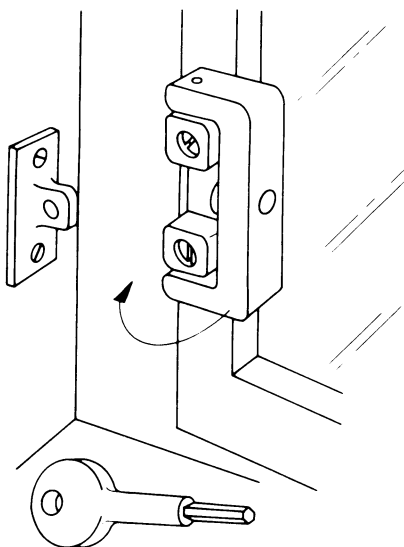
 Location of additional independent locks necessary for security (two on large window, e.g. if hinged side or pivot axis exceeds 0.9 m)
Figure 1 — Typical hinged and pivoted windows (various framing materials)



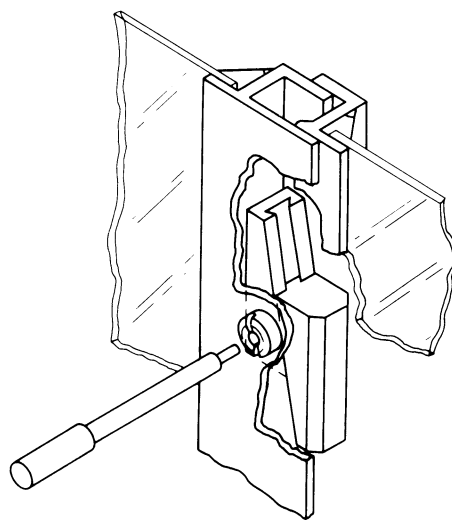
(a) Turn button to secure window:
differ key to unlock.



(b) Push button to secure window:
common key to unlock.



(c) Common key to secure window and to unlock.



(d) Internal casement lock for steel casement window:
common key to secure and unlock.

NOTE All screws are concealed when the windows are secure. Differ key locks are more complex and hence more costly.

Figure 2 — Typical independent locks that provide additional security by supplementing the existing lockable or non-lockable hardware for hinged or pivoted windows