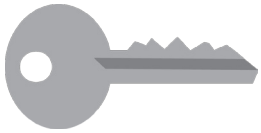
A practical guide



Security in museums and galleries: advice for architects and planners

The following advice is given for buildings housing collections which need to be protected from theft and damage and where a level of security has to be achieved to take advantage of the Museum Accreditation Scheme, Government Indemnity Scheme, loans from national institutions, Lottery funding and preparing general security improvement programmes.

At an early stage a policy decision needs to be made on whether the building will be manned 24-hours a day. If this is the case then some limitation on the strength of the defensive measures may be acceptable. If not then the strongest possible defences will need to be provided.

It may be intended that the security arrangements of the whole of the building should be of the standard required to obtain the grant of government indemnity for exhibition of borrowed artefacts.

It must be understood that even if the standards discussed in this paper are achieved there will not be automatic grant of indemnity for each and every proposed exhibition. Each application is considered individually, taking into account the nature, value, attractiveness, portability and disposability of the material forming the exhibition. In the case of very high-risk exhibitions - such as the display of gold artefacts – it may be necessary to impose additional security conditions such as the deployment of 24-hour guards before indemnity can be granted.

Physical Defences

An intruder detection system will identify an intrusion into a building but it provides no form of resistance to intruders. This can only be done by physical means, which can often defeat the intruder or at least buy time for police to attend in response to the activation of the alarm. For this reason physical defences form the cornerstone of Arts Council England security policy.

The nature of the collection, its value and its portability will influence the degree of protection provided but the shell of the building must in all cases be of substantial construction.

- brick, stone or concrete materials generally provide the best resistance to forcible attack.

- openings in the perimeter such as doors, windows and rooflights must be reduced to the absolute minimum.

- those remaining should be strengthened to deter and delay entry

New Buildings

Basic security measures can be designed into new buildings. It is not intended to restrict the architect's freedom to design buildings suitable for the surrounding environment or those which will enhance a museum collection; but the architect is entitled to an explicit brief on security matters in the early stages. Security advice taken at this stage may not only avoid the need for additional security measures that might spoil a building's appearance but it will also prevent additional security costs being incurred at a later stage.

The Design Stage

Building security requirements into the design at this stage makes it possible to limit features that might assist an intruder to gain access.

- as the shell of the building is usually regarded as the security perimeter the number of openings should be limited to those necessary for access, ventilation and natural light.

- doors, windows and rooflights must all be protected to reduce the risk of large volume loss during the silent hours and have the ability to resist a determined physical attack for as long as the time needed for response forces to attend.

- the presence of pipes, ledges and buttresses can make windows, rooflights and doors accessible to the intruder.

- access/exit can also be made easier through the provision of emergency escape routes that are not secured internally during closed hours or sufficiently protected during open hours.

- good design can also reduce the possibility of thieves concealing themselves within premises during open hours to break out after closing time. By avoiding unused spaces, dead ends, insecure ducts and panels spaces where someone could hide threats to the collections from theft can be limited.

- provision needs to be made for a secure division between the areas which are open or closed to the public with the intruder detection system designed accordingly.

- attention paid to the exterior can prevent areas for concealment such as vegetation, porches, deeply recessed doors and adjacent buildings.

- the risk of attack from an attached building that is not defended to the same degree may not be immediately apparent but this may require the party walls to be of stronger construction than might have been otherwise necessary.

Existing Buildings

A very wide variety of premises are used to house museum collections. Many were not built for the purpose and security requirements played very little part in their design and construction. The listing of a museum as a building of special architectural or historical interest restricts alterations or additions unless listed building consent can be obtained.

- whenever possible unused doors and windows should be bricked up to the same constructional strength as the surrounding wall. By leaving a door or window in place and confining the infill to the interior of the building it is possible to retain a museum building's appearance.

- rooflights should also be eliminated if not required although it is recognised that in top-lit galleries this may be impracticable.

- some strengthening can be achieved with the advice of planning authorities especially by taking advantage of maintenance and repair programmes. For example a roof constructed of slate or tile to unlined battens can gain considerable strength if the slates are re-laid to a close-boarded timber covering and/or an expanded metal shield provided at a time when reroofing takes place.

Securing all apertures to existing museums can be a substantial and expensive task. Sometimes the best approach is to define a small high security perimeter drawn around the high-risk items with the remaining area becoming an alarmed buffer zone.

Mixed Use of the Building

Many museums offer space for private and commercial functions either during or after normal public opening times and put on their own receptions for the opening of special exhibitions. Unless the design of the building takes these different uses into account, collections can be at increased risk with a demand for additional costly staffing. Good design, for example, can provide a strong physical separation of function areas with appropriate catering and toilet arrangements.

Stores

Collection stores need to be planned so that they are in a separate secure alarmed state from other parts of the building.

Door Defences

A variety of different degrees of protection can be provided to doors and their openings.

- an exterior door must at least be constructed of solid hardwood or solid hardcore construction. Further strength to meet increased risk can be provided by using steel doors of varying thickness or laminated security doors with reinforced plastic or steel sheet inserts.

- a door frame must always be capable of carrying its door and be of at least equal strength. Security doors and frames can be provided in their own purpose made sets.

- glazed doors to the exterior must always be regarded as weak and supported by a secondary system such as steel roller shutters, expanding steel gates or laminated security doors fitted inside the primary door. These can be cost-effective and aesthetically acceptable.

The weak point of any door is often the locking system so care must be taken over the choice of system, in consultation with a master locksmith in the case of high risk premises. Locks come in many different types, sizes and qualities but careful consideration should identify an appropriate system. Hinge bolts will help to hold the door in its frame during an attack and are essential if hinges are exposed to the attack side. Proper provision needs to be made for key safes or cabinets.

Emergency Exits

While public escape routes are essential it is important that emergency exits do not make it easy for a thief to make a rapid escape. This applies whether the premises are open to the public or closed. Security requirements can seem to conflict with safety requirements for emergency exits. The interpretation of the legal requirements for escape routes varies from area to area so it is hard to offer a simple rule on this matter. Often during museum hours, it has been possible for a thief to snatch, or smash and grab, and flee through a nearby exit. The thief can be thwarted if the door is additionally secured by an electromagnetic lock which is connected to the fire alarm system. Alternatively a solenoid switch incorporated into the release equipment can delay the release for a short predetermined period.

At night, when the premises are unstaffed, some form of deadlocking can be used but it is essential that this is unlocked when the building is occupied. Staff responsible for opening up the premises can be reminded of this by linking to the intruder detection system control box where a ‘locked’ state can be visually and audibly indicated.

Window Defences

Windows and rooflights will always be a major problem for museum security. Sometimes even very high windows can be reached from adjacent roofs or ledges. The following can be used to advantage:

- glass bricks set in steel or concrete frames for rooflights.
- windows with a locked or steel sash with panes not more than 23cm x 18cm.
- narrow windows with effective openings of no more than 18cm.

Although it might be possible to treat some windows in this way the real defence of windows and rooflights will rest in secondary protective measures such as:

- steel roller shutters.
- iron or steel bars.
- collapsible gates or grilles.
- secondary glazing using for example glass//polycarbonate//glass lamination.
- intruder alarms

Experience shows that the value of an intruder alarm is limited if entry to and escape from the museum can be effected before the responding authority arrives on the scene. This is why the need for strong physical security has been emphasised above. An intruder alarm system can then be used very effectively by giving an early signal of an attack as the burglar attempts to defeat the building's physical defences. In combination these features give the appropriate authorities the best opportunity to respond.

It is imperative that the signal notifying an attack is safely transmitted to a monitoring agency. Museums can no longer rely upon systems which cause a bell or siren to sound on an external wall in the hope that the thief will be frightened off or a member of the public will alert the police. An automatic system, which uses a monitored telephone line (eg BT RedCARE) to an alarm receiving centre which in turn alerts the police, is essential. This is now so essential that if it is temporary lost for any reason then a human presence must be provided in its place.

Most intruder systems have a combination of perimeter and trap protection.

- perimeter protection is generally understood to include devices activated by intrusion or forcible attack upon the security perimeter. All openings in the fabric of the building such as doors, windows, rooflights and ventilation shafts (including those giving access from adjacent accommodation outside the museum area) need to be covered. The alarm company will take environmental factors into account but, where possible, early notification of an attack on the perimeter should be signalled. If the system only detects once the perimeter has been breached then valuable time will have been lost.

- trap protection is used to describe those devices activated once the intruder is within the perimeter. This form of detection relies upon the identification of movement and/or body heat. Modern dual technology detectors rely on the identification of both before an alarm is signalled. Although these units are more expensive they are more reliable and subject to fewer false activations.

A combination of these two approaches is the most effective way of providing the required standard of security. Given the emphasis above on the need for a physically strong perimeter, then perimeter protection is of primary importance.

The Police Response

For many years the police service has been struggling to manage the ever increasing number of false calls generated by automatic intruder alarm systems. Over 90% of the calls relayed to the police do not result from a criminal act but from wrong setting or unsetting of the system by the user, defective or inappropriate equipment or line faults.

The Association of Chief Police Officers (ACPO) has therefore devised a policy for the management of alarm systems to reduce the waste of valuable police resources. Most forces in England and Wales now apply most of the principles set out in the policy but the means of doing so can vary locally.

Fire Detection

Without early detection whole collections and buildings can be lost. It is therefore essential for museums and galleries to have an automatic fire detection system that will give an early indication of the presence of fire. A number of systems are commercially available that will detect heat and/or smoke. They then transmit an alarm over a telephone line to the fire brigade, or more often to an alarm company's receiving centre as well as causing a local alarm to initiate an evacuation of the premises.

Fire Extinguishers

Sufficient and suitable fire extinguishers must be available throughout the building.

Sprinkler Systems

Improvements to the reliability of fire detection systems have made them more acceptable to museum and gallery authorities, especially when the cost of providing night guards is taken into account. There is still, however, considerable resistance to the use of automatic suppression systems such as sprinklers. Understandably museum staff fear the destructive consequences of an accidental discharge of water upon the collections in their care.

Displays and Exhibitions

Internal Layouts and Visitor Flows

The layout of exhibitions and circulation routes through galleries can be arranged to provide the maximum security protection without limiting the presentation of the collection. Such layouts must also be able to cope with the flow of visitors in both normal and abnormal circumstances. Galleries situated away from outside walls and above ground level are also less easy to penetrate and thus are likely to be more secure. When planning the layout of exhibitions particular attention must be given to:

- sightlines to ensure that invigilators have the best possible view and no hidden corners are created where a criminal can work in seclusion.
- display of material in such a way as to prevent easy removal by opportunist or determined thieves.
- open displays or room settings where exhibits are directly accessible to visitors.
- paintings, drawings and similar objects that should be secured to the walls by mirror plates and security screws or similar approved methods.
- high value pictures may be further protected by alarms
- no objects which could be easily removed should be displayed close to doors giving ease of escape from the building.

Display Cases

Display cases are the last line of defence for exhibits in public galleries. Cases are sometimes required to provide an appropriate environment for sensitive exhibits but they may be more necessary for security reasons. While large exhibits such as paintings and statues may be protected by appropriate physical or electronic barriers, small and attractive and fragile objects should be housed in strong, secure display cases. Varying levels of protection can be provided to reduce the risk of accidental or intentional damage and theft but much will depend on the quality and number of security staff available in the area. If a case is robust enough to resist attack this may compensate for limitations in another element of the security provision.

Invigilation

Whilst some establishments are able to employ attendants solely in the role of gallery invigilators, many museum authorities use them to cover a full range of security and other duties. They are an essential element for maintaining good security. Good design can make the best of the services.

In the absence of night-guarding most buildings, if protected in accordance with Arts Council England advice, can be left unattended. Even when a night guard is employed modern practice is to monitor the building electronically and by closed circuit television rather than by regular patrol alone.

Closed Circuit Television (CCTV)

The use of CCTV to counter criminal activity is now common, but its application needs to be carefully thought through if it is to achieve maximum benefit. It could now be argued that the point has been reached where museums with high value property that do not have the benefit of cameras could be at increased risk.

CCTV can enable invigilators to be more effective, act as a deterrent, make recordings to assist with post-incident investigation, assist with entry control arrangements, provide general information to assist in the management of the premises and where the premises are guarded out of hours to assist with site monitoring.

Access Control Systems

Advances in technology over recent years have brought about various means of controlling access for visitors, staff and others to buildings and parts of buildings. The use of such systems needs careful planning. Integration with identification cards can be cost effective, although vicinity or touch devices are often more popular with users than simple cards. Access control systems can be used very effectively to monitor access to high value areas such as stores, but should not be the primary security measure. . Similarly, they should not be relied on for external doors when the building is secured for the night.