clever • skilled • creative

Security Design Requirements

Department of Education and Training
School Security Program

Queensland Government
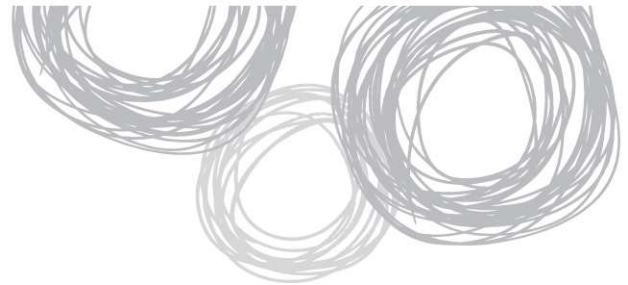
Table of Contents

Further Reference Documents:

Technical Specification for School Security Systems

Security Fencing Specification

PREAMBLE

This document has been developed for use in the designing and upgrading of new school buildings and is to be read in conjunction Australian Standards AS2201, AS5039, AS1670 and design guidelines for other building elements such as the Design Requirements for Education Queensland School Facilities.

The information outlined below is to be included in all designs to ensure a safer and more secure facility to reduce the overall security risk associated with the ongoing operation of the school. By incorporating these design standards it is envisaged that the life of a building will be extended and the level of maintenance and retrofits required reduced to an acceptable level.

The two fundamental areas of building security are:

- **Physical security** - The layout of buildings and other structures on the site and the designed access control possessed by each building; and
- **Electronic security systems** – Including intruder detection systems, fire detection systems, emergency tone warning systems and closed circuit television (CCTV) systems.

SECTION 1 – PHYSICAL SECURITY

1. Crime Prevention Through Environmental Design (CPTED)

The physical design elements have been developed in alignment with the elements of **CPTED Guidelines for Queensland. CPTED incorporates environmental cues that highlight the purpose of the space and define desirable and acceptable behaviour in the space.** CPTED is a necessary element towards designing a school layout for long lasting crime restricting benefits and a decreased need to implement "band aid" improvements reactive to incidents.

The premise that underpins CPTED is "*that the proper design and effective use of the built environment can lead to a reduction in the incidence and fear of crime as well as an improvement in quality of life*" for the intended users of the environment.

The six key CPTED principles central to designing safer places are:

- **Surveillance**
- **Legibility**
- **Territoriality**
- **Ownership**
- **Management**
- **Vulnerability**

These strategies are covered in the following sections, as well as mechanical access control.

2. Surveillance

There are three forms of surveillance*: Informal (passive) Surveillance* from casual observers such as the School Watch Program, *Organised Surveillance* by trained security guards and other trained personnel, and *Mechanical Surveillance* in the form of security cameras. Refer to Paragraph 3 below for information

relating to Mechanical Surveillance. Section 3.29 of the [School Security Handbook](#) contains advice on organised surveillance in the form of security patrols.

CPTED concepts are aimed towards informal surveillance so that anti-social behaviour or crime related activities are discouraged, detected and prevented. This form of surveillance increases the risk of detection of unauthorised users and reduces fear for the intended users of the space. The following strategies are recommended to maximise the potential for passive surveillance.

2.1   Landscaping

Landscaping can be effectively used to direct people traffic toward good surveillance points or preferred egress points. This also has the benefit of adding risk to unauthorised persons by adding time to egress from the site. Selection of appropriate landscaping materials to restrict the use of potential projectiles such as rocks and pavers

2.2   Maximising distance from school boundary to buildings

Schools located in proximity to shops, hotels and parks may become an easy target for vandalism and break and enter. Distance adds unwanted time for the perpetrator and in the case of theft, difficulty in stealing more than a couple of items.

Where possible, locate buildings with a set back of 50 metres, except where barriers, such as residential properties and high fencing, restrict access to the school site.

2.3   Alignment and design of buildings to provide clear lines of sight

Providing clear lines of sight can enhance surveillance by playground duty teachers, security officers and passing traffic. This includes siting buildings to allow for clear lines of sight to gathering areas, amenities facilities and lines of approach to buildings.

Minimise blind spots where there is a reduced opportunity to see and be seen i.e. eliminate places that can be used for entrapment of victims or for hiding from surveillance. If concave sections of a building shape are necessary or desired, consideration should be given to rotating this section to face towards good surveillance, such as the centre of gathering points.

If stairwells or open under ramps are part of the building design, the space underneath must be closed to avoid it being used as an entrapment or hiding place.

- Inside buildings, maximise the ability for clear lines of sight to areas such as student foyers and learning spaces that can be unattended for short periods.

2.4   Landscape design to provide clear lines of sight

To enhance surveillance, provide clear lines of sight that are not restricted by vegetation, screens, fences and elevation changes such as mounding.
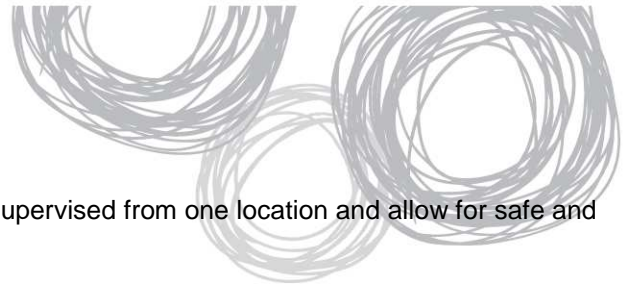
Maximise the extent of outdoor areas that can be supervised from one location and allow for safe and easily supervised access to student toilets.

Seating in outdoor gathering areas and waiting areas (eg near bus pick up area) should have clear surveillance around the seating.

Vegetation that allows clear visual access between the heights of 700 and 2200 millimetres should be provided. This will allow for viewing over low bushes and under the canopy of trees or shade structures.

Provide dark colour finishes to fences and screens to allow clear visual access. Light coloured finishes (eg white or cream coloured powder-coated finish) produce excessive glare to restrict vision beyond the structure.

3. Mechanical Surveillance

3.1. Access lighting

Provide illumination to assist authorised persons needing to enter the school grounds and in moving around the school for legitimate purposes (cleaners, security providers and community user groups). Design lighting to ensure appropriate surveillance and avoid shadows and glare which might put people at risk. Install adequate access lighting in the following locations:

- Steps, ramps and gathering areas
- Verandas, covered links
- Major pedestrian paths
- Street pedestrian entry, internal roads where appropriate and car parks

Lighting fittings shall have vandal resistant fittings and covers.

Access lighting switching shall be integrated with master lighting controls and time clock controlled.

Freestanding lighting shall be erected above 3 metres in height to reduce the risk of wilful damage or vandalism.

Technical requirements for lighting shall be according to Australian Standards AS/NZS 1158 Lighting for Roads and Public Spaces.

3.2   Security lighting

Provide security lighting to the school perimeter only, to enable detection of persons approaching the school buildings and grounds. Lighting should be faced inward to avoid glare to persons looking into school grounds. Security lighting shall be installed at all entry points and at the location of external security system keypads. Sensor lighting in high/extreme risk schools may also be considered around high-risk areas that will act as a deterrent to unauthorised persons.

Security lighting shall be integrated with master lighting controls.

All freestanding lighting shall be erected above 3 metres in height to reduce the risk of wilful damage or vandalism.

Technical requirements for lighting shall be according to Australian Standards AS/NZS 1158 Lighting for Roads and Public Spaces.

3.3. Closed Circuit Television

As a crime prevention tool, CCTV is a good aide i.e. in picking up images, but not as a deterrent.

In accordance with Education Policy and Procedures Register Module *SCM-PR-005: School Security*, CCTV considerations must be referred to the School Security Program for advice. Refer to *Section 2, Electronic Security Systems, paragraph 7* for information regarding CCTV.

Where CCTV is considered appropriate, lighting shall be provided for night time operation.

These strategies are covered in the following sections, plus the topics of physical access control and physical surveillance.

4. Legibility

Legibility is about way finding with confidence i.e. knowing where you are, where you are wanting to go, and how you are wanting to get there. It is not confusing and does not easily get people lost.

Legibility is not about making every built environment the same, but celebrating differences while making enough things visible and clear enough to give out the right messages such as with signage and landscape design. Some topics from the surveillance section are also relevant for legibility as well as the topics below.

4.1. Designing preferred / safe access routes

Ensure that public access from the main entry to administration block is clearly defined.

Access routes shall be designed in a way that makes them easy to understand and navigate within. Consider the following elements to enhance the design of preferred and safe access routes:

- Actual width and also the perception of width of pathways
- Good surveillance around the pathway
- Colour and texture of the floor surface, especially leading to preferred locations such as Administration
.
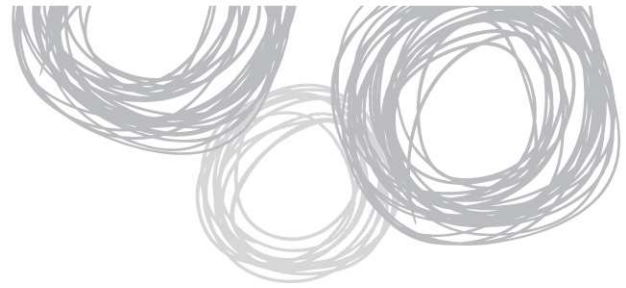
4.2. Celebrated Entries

A well-defined aesthetically pleasing entry statement clearly defines the desired entry point for visitors and the consequences for illegal entry. This entry statement can include an architectural feature combined with effective signage, landscaping and fencing to direct pedestrian traffic.

Provide a distinctive and identifiable pathway that leads to the main public entry point of Administration to assist visitors to the school and reduce the risk of unauthorised persons diverting from the main entrance and entering other parts of the school site. Suggested concepts include a unique coloured path or physical border such as landscaping or fencing.

4.3. Signage

In all circumstances signage shall be clearly visible and not obstructed by landscaping or other structures. Signage shall support way-finding by use of maps and/or identifying elements such as building names and directions to services. Detailed site map signage shall be provided at main entry points to guide all visitors to the Administration area. Fixed signage shall be vandal proof in terms of graffiti and removal of the sign. Other factors to consider include:

- Locate signage in logical places such as building entrances and at other points of decision to assist users to travel quickly and safely around the site
- Ensure signage is itself legible, including well-lit, using strong contrasts and colours, sufficiently large or reflective to be read at an appropriate distance at different times of the day

Buildings

For the purposes of directing emergency personnel, police and security personnel, each building shall be identified by clear signage stating the title as determined by the school community. Alphabetical identification i.e. A, B, C, D etc or marking by title such as "Administration" or "Science" is recommended. Signage should be unique to each building, easily read from main circulation paths and located to identify the building entry point.

Doors

Provide external and internal signage to show room numbers to all key locked rooms. Provide name or function signs to all service rooms (eg. Cleaners store). For rooms containing hazardous or flammable materials, provide appropriate signage. Provide fire egress signage as required to comply with building standards.

Perimeter Fence

Signage to deal with the matters below shall be provided where applicable and be fitted at all external fence line entry points and if appropriate, at intervals of 100 metres. Aspects to consider include:

- Directing persons to Administration
- Advising of after hours policy
- Grounds use policy
- School Watch
- Parking restrictions
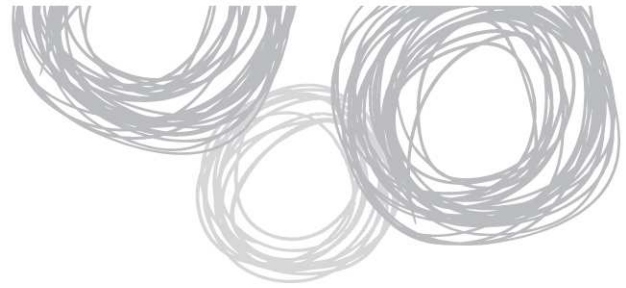
5. Territoriality

Territoriality conveys information about proper boundaries and helps determine how spaces will be used and what represents appropriate behaviour within them. It can enhance security or defensibility of property by clearly identifying the difference between what is public and what is private territory.

Landscaping features like planting, changes in materials and texture, changes of level, artwork, signage, low walls, seating and the like define desired movement areas and delineate borders. These physical and symbolic barriers personalise and/or claim territory identifying behavioural expectations of the area.

5.1. Hierarchy of space

Hierarchy of space supports security by defining clearly legitimate boundaries between private, semi private and public space. Territorial "cues" are designed to increase through these levels, promoting the expectation that inappropriate behaviour is less tolerated.

Barriers can be used to create a hierarchy of space for:

- Celebrated entries
- Gardens
- Distinctive colour or tactile surfaces
- Lawn strips
- Ramps and elevation changes
- Signage

5.2. Fencing

Fencing not only defines boundaries of space, but can also be effectively used to direct people toward safe access and travel points. Restricting access to safe places by unauthorised persons or increasing the risk of their detection can also be achieved.

Most school sites have several access points, such as two street frontages with several pedestrian and vehicular gates, entry gates off residential development and adjoining parks and bush reserve. Unauthorised access is difficult to manage in these circumstances, but can be assisted by well-planned fencing and gates to:

- Clearly delineate the school boundary and preferred entry points
- Enable the school to close off some gates during class time to limit and control unauthorised persons and vehicles entering the site – during these times all traffic can then be directed to a point with good daytime surveillance, such as adjacent to Administration
- Ensure that unauthorised persons using the school as a thoroughfare walk around rather than through the property
- Restrict the ease of removing stolen goods from the site

Please refer to the latest version of the Department of Education and Training (DET) Security Fencing Specifications.
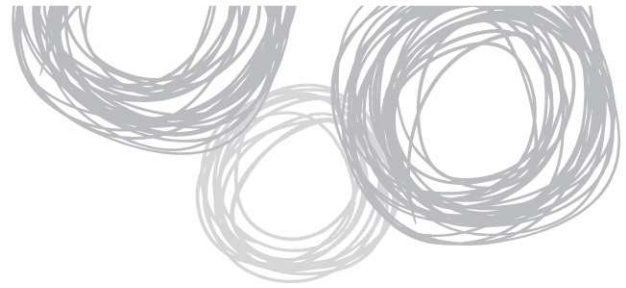
5.3. Pool Fencing

It is essential for health and safety reasons that all possible steps have been taken to ensure children cannot access the pool area without the permission or supervision of an authorised person. Pool/dam fencing shall comply with relevant legislation.

6. Ownership

Passive surveillance is most powerful when the people who are around and able to see what is happening go on to respond in ways that will enhance their safety, the safety of others and promote a sense of pride in the school community's assets.

6.1. Environmental Management

It is important to promote a feeling of individual and community ownership of school space that will encourage a level of shared responsibility for security, in turn reducing the likelihood of crime. This can be achieved through:

- The use of murals, with consideration given to local cultural influences
- The use of colour and materials that provide graffiti and vandal proof structures
- Selection of appropriate landscaping materials to restrict the use of potential projectiles such as rocks and pavers
- Centralisation of "like" activities
- Avoidance of conflicting or ambiguous land use
- Allow multiple passageways around outdoor gathering and seating areas to reduce likelihood for conflict
- "Place manage" by communicating the "do's of an area, not the "do nots" which will highlight the desirable activities or uses of school space

7. Management

Facilities that look well looked after send out messages to would-be offenders that the community cares, promoting a sense of pride and ownership. Places that look unloved, broken down, dirty or vandalised are less likely to encourage active legitimate use and may lead to an increase in crime.

7.1. Maintenance and Housekeeping

Well maintained facilities support desirable behaviour and enhance the intended functionality of the space. Undesirable behaviour can be reduced by ensuring routine and emergency maintenance are carried out when required. To assist schools to minimise unplanned maintenance:

- Ensure placement of signage cannot be obscured by vegetation
- Ensure future clear lines of sight by planting shrubs/trees that will allow clear visual access between 700mm and 2200mm
- Use resistant finishes, where possible to limit vandalism and graffiti
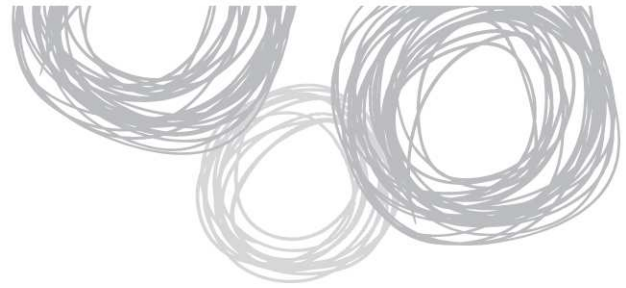
8. Vulnerability

Some situations and places make people and property more vulnerable to harm than others. Isolated places are more vulnerable, while hidden places known as entrapment areas provide opportunity for unforeseen crime to occur. To prevent this, the following strategies should be implemented:

- Centralise like activities
- Locate signage at decision points eg, where pathways intersect
- Minimise, or where possible remove, concealment areas such as building alcoves or areas that could be used by would-be offenders to hide or be screened from surveillance
- Minimise features which create natural ladders
- Allow for clear lines of sight (refer to Surveillance section)
- Provide well-lit active pathways or routes throughout the site (refer to Legibility section)

9. Physical Access Control

Physical controls that contribute to target hardening, such as locks, windows, doors, grilles and intruder detection are covered below.
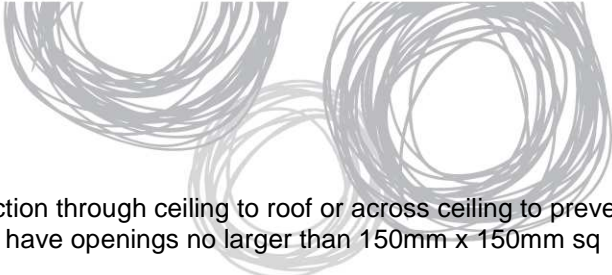
All schools are given a security "Risk Rating" which will determine the required security treatments. Refer to DET "School Security Program" on 07 3237 0874 for risk ratings of particular schools.

Refer to Appendix 1 for category descriptions.
Refer to Appendix 2 for specific category requirements.

9.1. Windows / Louvres

Window treatments differ depending on the use of the area and what is housed inside. In high traffic areas, near playgrounds and in vandal prone areas, windows must possess a level of impact resistance. In buildings containing portable and attractive equipment or resources additional layers of security protection are required. Refer to appendix 1 & 2.

- Steel security mesh refers to "Crimsafe" or approved equivalent to meet Australian Standards AS 5039-2003 or 5039-2008
- Windows and/or louvres shall not be installed within 900mm adjacent to door handles
- Fixed section of sliding windows shall be located adjacent to door hinge portion of door
- The use of many smaller windows and/or louvres, rather than large ones to restrict ability to remove assets from buildings
- Louvres shall have steel security mesh screens installed
- Windows and/or louvres shall comprise laminated glass / security film to reduce glass breakages and easy access
- Key lockable push button plunger locks shall not contain removable pin and shall be mounted so as to lock into window frame
- Where a large "Feature Entry" (i.e. large glass doors and panels, halls) is installed and it is impracticable for steel security mesh to be used, laminated glass shall be used.

- Category B areas require steel mesh protection through ceiling to roof or across ceiling to prevent access via the roof cavity. Steel mesh shall have openings no larger than 150mm x 150mm sq and no smaller than 4mm in diameter.

9.2. Doors

The level of door security depends on the type of door, its location and what is housed inside. For example, external entry doors require a higher level of security than internal doors, however, secure store doors, although located internally, have additional levels of security again due to highly valuable resources and files contained in the room.

Standard access door furniture shall be equivalent of a mortice lock with internal snib on all doors, except where stipulated in Appendix 2. All door security treatments shall meet Building Code of Australia compliance in relation to building egress. Refer to the room classification table in Appendix 2 for all door security treatments.

External Door Types

- External door shall be solid core with non removable hinges. Where viewing is pane required, additional security treatment of steel window security mesh shall be installed with anti-tamper screws
- Aluminium hinged single or double doors shall comprise 2 panels with mid rail.
- Aluminium sliding doors are only to be installed in special circumstances and shall comprise 2 panels with mid rail for each opening door.
- Double and 1 ½ leaf swing door panels are not acceptable on single door ways.

9.3. Locks and Key System

- Locks shall have a "restricted registered master key" system equal to "Lockwood twin security keying system, authorised dealer service level, which includes grand master and sub masters and shall be capable of accommodating future extension.
- Locks shall be equal to "Lockwood 572" series
- Metal lockable key cabinet of suitable size shall be provided in the Administration Secure Store room for storage of keys.
- Window push plunger locks shall be keyed alike throughout the school

Standard keying plan for all schools shall be provided to provide simplicity and consistency in maintaining keying systems effectively over the life of the school.

9.4. Roof – Skylights

Roof access shall be minimised by ensuring that climbing structures are not freely available for unauthorised persons to use to their advantage (climbing onto roof, hiding on roof or breaking and entering through roof).

Skylights shall have steel welded internal mesh bars at the highest point of the shaft. Skylights are prohibited in Category A & B areas.
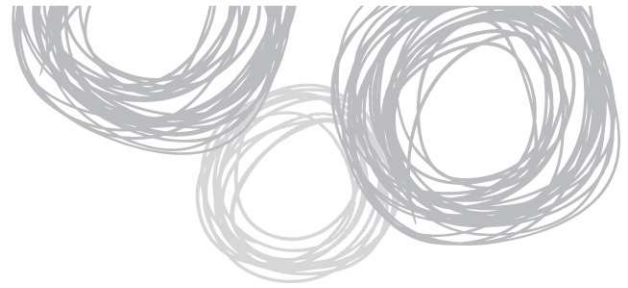
9.5. Rooms Containing High Risk Equipment *(additional factors to be considered)*

Theft of attractive items such as computers, audio/visual and IT peripherals is easier when these items are placed within reach of a window. It is important to consider providing design strategies to reduce the risk of theft, including the following:

- Where possible locate data points to encourage computers to be located against internal walls as a priority over external walls i.e. Classroom design to include a circulation passage along external window side of the room
- Where possible, provide storage areas for portable items
- Window protection, including keyed window locks, glass breaking prevention and restricting view from the outside (Refer appendices 1 & 2)

10. Other Elements

10.1. Taps

External taps shall be fitted with anti tamper (removable) handles to prevent unauthorised use.

10.2. Fire Hose Reels/Hydrants

Fire hose reels and hydrants shall be installed in accordance with requirements of the Building Code of Australia. Where possible locate fire hose reels internal to the building within an enclosed cabinet/cupboard. Where fire hydrants are installed the hydrant shall include a lockable fire hydrant cover secured with 003 keyed padlock.

10.3. Bin Enclosures

Provide lockable fenced and roofed storage area for school provided mobile refuse bins, commercial rubbish and recycling bins in at least one location:
- Ensure that bin enclosures are located away from perimeter fences and school buildings.

10.4 Anti-Skating Devices

Fit all external seating, path and ramp railings and outside stage areas with anti-skating devices.

SECTION 2 – ELECTRONIC SECURITY SYSTEMS

The following standards have been developed to provide minimum standard levels for the provision of electronic security infrastructure and have been established in accordance with the relevant Australian Standards, Codes of Practice and legislative requirements.
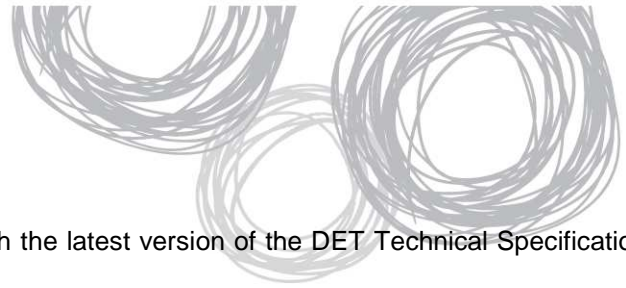
These standards are to be read in conjunction with the latest version of the DET Technical Specification for School Security Systems.

The outcome of a design process based on these standards shall be an Engineering Schedule and drawings which completely and accurately define the required scope of work and which, together with the relevant specifications, can be used to produce an installation which satisfies DET's requirements for both the design and construction of electronic security in schools.

1 Contract Conditions and Commissioning

1.1 Contract Preparation

The provision of electronic security in schools should not be considered as a small sub-contract element of the electrical contract, but under a distinct and separate contract constituting an important aspect of a school construction.

Contracts for the provision of electronic security services to schools shall include a figure for the retention of funds from the contract value. This retention figure would only be payable once the system has passed the final commissioning inspection and should be of significant value to encourage the contractor to perform immediate repairs or rectification of defects.

All responsibilities for the security of the site shall remain with the contractor and the contractor is to be held liable for any loss or damage suffered by the Department of Education and Training as a result of failure to maintain security of the site until the installation has passed the final commissioning inspection and handed over for administration by the school and monitoring by State Government Security.

The contract shall incorporate the scope of work as defined by the Engineering Schedule and drawings and the DET Technical Specification for School Security Systems which contains particular documentation requirements and specific processes and conditions for acceptance and handover of the system.

The contract shall determine the position of an Inspection Officer and codify the authority of the Inspecting Officer as those detailed below. The Inspecting Officer shall be a person nominated by DET's, School Security Program and shall be:

- Responsible for the performance of the inspections detailed below
- Authorised to determine the party responsible for any defects and instruct them to repair same
- Authorised to withhold the release of the retention figure detailed above

1.2 Contractors

All work shall be performed only by specialised security contractors who appear on the current Register of Pre-Qualified Suppliers for the Provision of Electronic Security Services in State Government Schools. This list is available from State Government Protective Security Services (telephone 3224 6212).

Tenders are only to be offered to these contractors.

1.3 Inspections and Commissioning

The technical specification contains specific requirements for progress inspections and the final commissioning inspection. Progress inspections may be conducted at any time desired by the Inspecting Officer.

2 Extent of Provision – By Type of Project

2.1 New Schools

It is mandatory for all new schools to be provided with the following electronic security systems or functions:

- A single electronic security system performing intruder detection functions to AS2201 and the latest version of the DET Technical Specification for School Security Systems
- Fire detection system(s) to AS1670
- An emergency tone warning system to AS2220

New schools may be provided with the following additional electronic security systems or functions:

- A closed circuit television system
- Electronic access control functions

Advice should be sought from the School Security Program (07 3237 0874) to obtain a relevant school risk rating to determine the justification for these types of additional security measures.

2.2 Staged Projects

Where construction projects are completed in stages, eg. new schools, stages 2 and beyond, incorporate extensions to the existing electronic security system and the contractor for stage 1 shall perform the work for all subsequent stages.

This is to:

- Ensure continuity of standards for workmanship, equipment, documentation, etc over the entire project
- Ensure continuity of the warranty throughout the entire project
- Eliminate disputes between contractors over issues of defects, warranty and interference with existing work
- Ensure greater value for money

2.3 School (incl ECEC'S) Upgrades, Extensions and Repairs

When building work is undertaken at an existing school (for eg; new buildings, extending the building floor area, upgrading internal linings or undertaking modifications to internal room layout) the following actions shall be taken in relation to the provision of security systems:

- Where an existing electronic security system exists in a school, a sustainability assessment of the existing system (technology and capacity) should be undertaken. Then any new building will be incorporated into that system or where necessary an upgrade to the security system to DET Specifications shall be carried out to incorporate the new building.

- Where there is no existing electronic security system, a new electronic security system shall be installed in accordance with current DET Specifications where the school has been identified

through the risk assessment process to be at medium, high or extreme risk and local infrastructure is in place to be able to provide the necessary and alarm response service.

- Where the school is in the "very low or low" risk category or where provision of an electronic security system is impractical due to the unavailability of local response service, then consideration should be given to providing enhanced physical security. (e.g. additional security screens).

The School Security Program (07 3237 0874) shall be consulted to obtain a relevant schools risk rating and to ascertain whether an alarm system may or may not need upgrading.

2.4   School Retrofits

There is no requirement to retrofit (upgrade or improve technology and components) of electronic alarm systems in existing schools, which are not being extended, upgraded or repaired.

3   Electronic Access Control

As mentioned in section 2.1, it is optional for electronic access control functions to be considered. However, where electronic access control functions are required, the following conditions are to be met:

- A single electronic security system shall be installed such that all electronic access control functions are to be integrally performed by the same system which performs the mandatory electronic intruder detection functions
- All equipment and work shall be in accordance with the latest version of the DET Technical Specification for School Security Systems

4   Electronic Intruder Detection

4.1   Mandatory, Optional and Prohibited Elements

Mandatory
It is mandatory for electronic security systems to include the following equipment and services:

- One single and unique Alarm Control Panel
- A LAN Communications System
- System Administration Software
- Power Supply Equipment
- Expander Panels
- Internal Keypads
- External Keypads
- External Satellite Sirens
- Internal Sirens
- Fire Hydrant and Hose Reel Water Flow Switches
- Intruder Detection Devices
- Duress Buttons
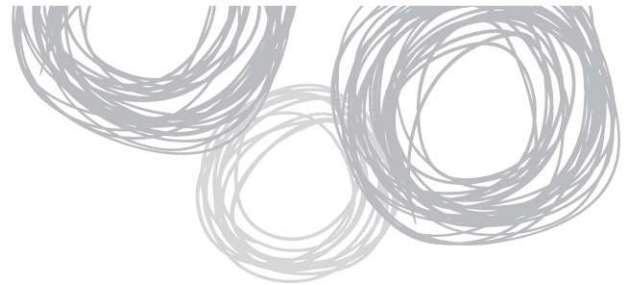
Optional

It is optional, where specifically determined by the School Security Program (07 3237 0874) for electronic security systems to include the following equipment:

- Wireless Duress Pendants
- Photoelectric Beams
- Glass Break Detectors

Prohibited

- It is prohibited for electronic security systems to directly monitor smoke or fire detection devices. These devices must be monitored by a dedicated Fire Indicator Panel (FIP). A single output from the FIP may be monitored by the electronic security system.

4.2 Equipment

The locations of all equipment shall be specified in the Engineering Schedule, which shall also define the required partitioning of the electronic security system into the separately controllable intruder detection areas. Each school building shall be a separate intruder detection area. The School Security Program is to approve the determination of these areas.

4.3 Alarm Control Panel

The alarm control panel shall be one of the approved types listed below:

- Inner Range Concept 2000
- Inner Range Concept 3000
- Inner Range Access 4000
- Tecom Challenger (not a "panel-link" network)

The alarm control panel shall be located in the same space as the telephone Main Distribution Frame (MDF) for the campus. Generally this will be in a communications cupboard or room in the Administration block.

The alarm control panel dialler shall be connected to a dedicated PSTN telephone line which is provided for the exclusive use of the alarm system and is not shared with any other device.

The alarm control panel shall be supplied and fitted with the maximum possible memory expansion and the manufacturer's latest firmware version.

4.4 LAN Communications System

A highly secure, reliable and stable LAN communications system is required. The school's optical fibre infrastructure shall be used to the maximum extent possible for the security system LAN. Manufacturer approved shielded, twisted pair data cable shall be used for all building internal LAN runs where optical fibre is not present.

For existing schools, the security system designer shall contact the schools Data Systems Technician to determine all physical and technical aspects of the school's optical fibre infrastructure. The system's LAN communications system shall be designed in accordance with the physical and technical aspects of the school's optical fibre infrastructure and the systems manufacturer's instructions.

The security system designer shall ensure that the communications signal attenuation and propagation and processing delays do not exceed the manufactures specifications.

Optical Fibre Modems

Optical fibre modems shall be used to convert between suitable LAN communications media. The type of the optical fibre modem used shall suit the type of fibre installed. Only optical fibre modems which are produced by the alarm system manufacturer shall be used. OEM or another manufacturer's products are not acceptable.

LAN Isolator Units

LAN Isolators shall be installed on all inter-building copper LAN systems. The number and location of LAN isolator units shall be as recommended or approved by the manufacturer.

LAN Transient Protection

Transient protection systems shall be installed on all inter-building copper LAN systems. Effective shielding and earthing arrangements shall be incorporated and all work shall be as recommended or approved by the manufacturer.

4.5   System Administration Software

Alarm system administration software and all associated cabling and equipment shall be provided to facilitate administration of the system by the school. A dedicated PC may be required in some instances.

4.6   Power Supply Equipment

All necessary power supply equipment shall be provided, including:

- Surge protected mains power outlets
- DC power supplies
- Operational and standby batteries
- Auxiliary DC power supplies where mains power supply is not stable or is regularly interrupted and where otherwise necessary

4.7   Expander Panels

Only 16 or 32 zone system expander panels shall be installed. The number and location of system expander panels shall allow for the efficient cabling, connection and operation of the system, take into account any future school developments and facilitate straightforward expansion of coverage in the future.

4.8   Keypads

All keypads shall be identical in appearance and function. Keypads providing a visual LED indication of area status shall display such status for the maximum number of areas the system can control. Community use buildings such as school halls and single purpose, autonomous buildings shall have
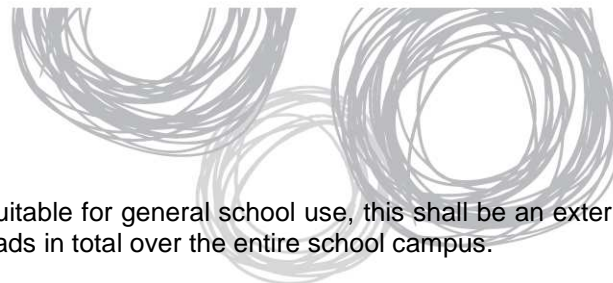
dedicated keypad. If such a keypad can also be suitable for general school use, this shall be an external keypad. There are to be no more than six (6) keypads in total over the entire school campus.

Internal Keypads

One internal keypad shall be installed in the Administration Block directly adjacent to the block's main entry door.

External Keypads

A minimum of one and a maximum of four external keypads shall be installed across the entire school campus. External keypads shall be installed under the following conditions:

- Under cover from the weather
- In well lit locations
- On blocks adjacent natural paths of pedestrian traffic
- Adjacent school boundary access points

External keypads shall be installed in IP66 rated enclosures (such as the Rittal EB series) and shall be fitted with:
- A cylinder lock which is keyed to the school's master key system; and
- A tamper switch to detect attempts to remove the enclosure from the mounting surface.

4.9   External Satellite Sirens

Only one single external satellite siren shall be installed for the entire school campus. This external satellite siren shall be installed on a block and in a location where it is most effectively visible and identifiable to neighbours and traffic outside the school boundary.
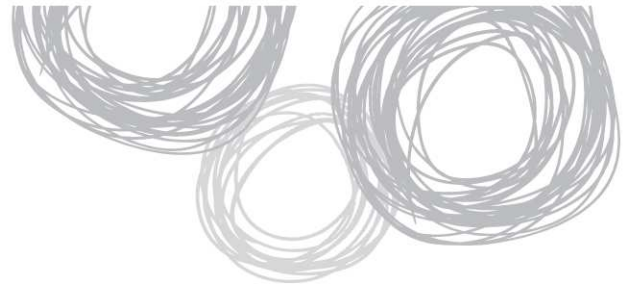
4.10   Internal Sirens

Multiple internal 12 Volt piezo screamers shall be installed in each system partitioned area such that the sound level generation produced is high, even and consistent throughout the entire area. Generally, every protected space shall contain an internal screamer or be directly adjacent to a room containing an internal screamer. Internal screamers are to be installed on the ceiling in the centre of the protected space. Screamers are not to be mounted on or adjacent to detectors or any other component of the electronic security system.

4.11   Fire Hydrant and Hose Reel Water Flow Switches

Fire hydrant and hose reel water flow switches shall be installed such that the operation of any hydrant or fire hose is detected. Each fire hydrant and hose shall be fitted with its own flow switch. Flow switches for fire hose reels shall be located within the hose reel cabinet. Each water flow switch is to be connected to an individual and separate alarm zone input.

4.12   Intruder Detection Devices and Duress Buttons

Each detection device and duress button shall be connected to an individual and separate alarm zone input. Appendix 3 defines the locations and types of equipment required. Only intruder detection devices which appear on the List of Approved Detectors in the DET Technical Specification for School Security Systems shall be installed. Movement activated intruder detection devices shall not be installed where they may be subject to draughts or environmental disturbances. This includes locations which are not fully enclosed or which are subject to natural ventilation.

5   Fire Detection Systems

5.1   Equipment

Where no BCA requirement exists to install smoke/fire detection, provide AS1670 compliant fire detection systems as per appendix 4. Fire detection systems shall include the following equipment:

- Fire Alarm Control and Indication Panels
- Internal Fire Detection Devices
- Internal Smoke Detection Devices

The locations of all equipment shall be specified in the Engineering Schedule. For these systems, connect a single, common alarm output from each fire alarm control and indication panel to an individual and separate input of the electronic security system for remote system monitoring.

5.2   Fire and Smoke Detection Devices

Provide fire and smoke detection devices to provide detection as per Appendix 4. Irrespective of the detector type indicated, provide detectors of a type that will be maximally effective in the location and avoid false alarms.

6   Emergency Tone Warning Systems

6.1   Equipment

Provide emergency tone warning devices to provide AS2220 compliant emergency tone generation throughout the entire school building and grounds spaces.

Emergency tone warning systems shall include the following equipment:

- Tone Generator
- Amplifier
- System Control Switch Plate
- External Speakers
- Internal Speakers
- Strobe Lights

It is optional for emergency tone warning systems to include the following equipment:

- Background music facility
- Public address facility

The locations of all equipment shall be specified in the Engineering Schedule.

6.2   Tone Generator

The tone generator shall have the capacity to enunciate a minimum of two distinctly different tones for occupant alert and evacuation. The system shall allow for, or be capable of expansion to meet, the requirements of the entire site including all known future expansion plus 25%.

6.3   System Control Switch Plate

A switch plate shall be installed in an approved position in the Administration Office for trained personnel to operate the tone generator. The type, location, construction and installation of switches shall prevent accidental operation.

6.4   External Speakers

IP66 rated horn speakers shall be installed throughout the school in external locations to provide tone enunciation to all grounds spaces. To reduce the opportunity for vandalism, all speakers shall be located out of reach from any adjacent ground, floor or support structure.

6.5   Internal Speakers

Internal speakers shall be horn, surface ceiling mount or flush ceiling mount type to suit the area under consideration and the mounting surface. To reduce the opportunity for vandalism, all speakers shall be located out of reach from any adjacent ground, floor or support structure.

6.6   Strobe Lights

Provide flashing strobe lights in locations where enunciation speakers are undesirable or ineffective. Such locations include but may not be limited to:

- A/V production and recording Studios
- Manual arts workshops and construction courts
- Rooms housing hearing impaired persons

## 6.7   Background Music and Public Address

Where background music and/or public address facilities are requested by the client, the location of the public address microphone, zone selection switch plate and music source shall be adjacent the system control switch plate in the Administration Office.

7   Closed Circuit Television Systems

As mentioned in section 3.3, it is optional for the installation of Closed Circuit Television (CCTV) to be included. A risk assessment must be conducted in consultation with the School Security Program (07 3237 0874) to determine justification for this system in new school sites.

All CCTV installations shall include the following equipment:

- Cameras c/w Suitable Lenses
- Camera Protective Enclosures
- Digital Video Recording System
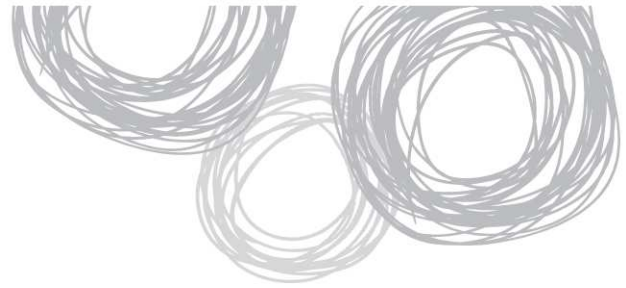
7.1   Equipment

Provide closed circuit television devices to provide coverage to particular school building and grounds spaces. Supplementary lighting may be required and is to be provided where necessary. The locations of all equipment shall be specified in the Engineering Schedule.

7.2   Cameras c/w Suitable Lenses

Unless otherwise approved, colour cameras shall be provided. CCTV cameras and lenses shall achieve optimum viewing coverage of the various locations under the various lighting conditions.

Cameras shall be located to provide video coverage of locations including but not limited to:

- School boundary access points
- Pathways and other natural paths of pedestrian traffic
- Public counters and cash collection points
- Pathway intersections
- Doors and points of access to critical locations such as high value computer rooms

The location, mounting height and orientation of all cameras shall be such that optimum surveillance is provided for the specified location. To reduce the opportunity for vandalism, all cameras shall be located either:

- Out of reach from any adjacent ground, floor or support structure
- Placed such that the camera is being supervised by at least one other camera

7.3   Camera Protective Enclosures

All CCTV cameras shall be mounted in high quality, heavy duty, vandal resistant protective enclosures specifically designed for the application.

7.4   Digital Video Recording System

For security and networkability, the digital video recording system shall be located in a secure location with the schools network servers. The operating software shall not to be a "windows" based program, but a true real-time operating system. The recorder shall employ the wavelet data compression method.

The size of the recording medium shall allow for a minimum recording time of one week with all cameras being recorded at the maximum possible frame rate for 24 hours a day, 7 days a week.
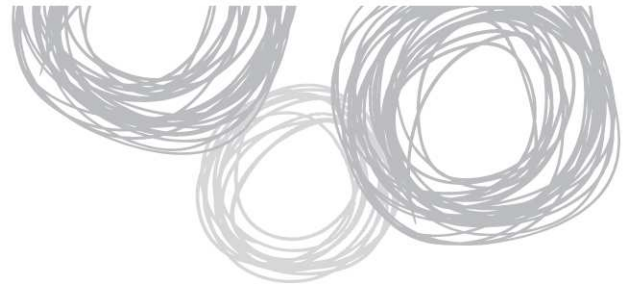
APPENDIX 1

Building/Room Security Categories

The following room types give an indication of the appropriate security category. Each project brief shall contain Room Data Sheets that identify specific security category required.

Category A
- Administration secure stores

Category B
- A/V equipment storage
- Musical instrument storage
- Sports equipment storage
- Computer server
- Cleaning chemicals, paint storage
- Grounds equipment storage
- Lighting/sound equipment storage
- Science chemical storage

Category C
- Administration
- Reprographics and resource Preparation rooms
- Manual arts rooms (tools etc)
- Computer rooms (6 or more computers)
- Home economics/Kitchens
- Canteens
- Art store/preparation
- Library/Resource
- Ancillary staff

Category D
- General learning areas
- Withdrawal rooms
- Music classrooms
- Science classrooms
- Hall/Performing arts
- Prep classrooms
- Special Education classrooms
- Staff amenities
- Ag units

Category E
- Kindergartens, ECEC, EYC
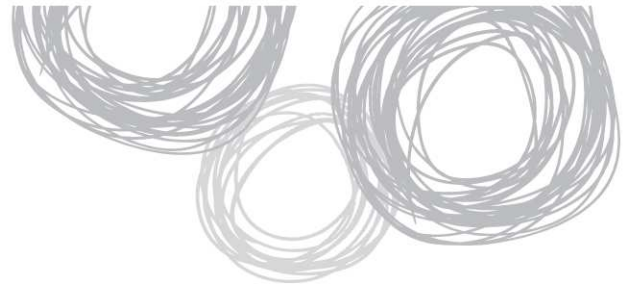
APPENDIX 2

Room Data Sheets – Specific Security Requirements
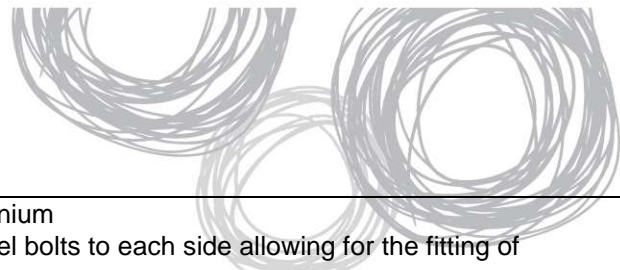
Category A

Areas requiring very high security and fire resistance for the storage of confidential records, irreplaceable documents and highly valuable materials and equipment that require protection against theft, vandalism and fire.

Windows	None
Doors	Equal to – • "Rivers" type steel security door with concrete filled steel frame, heavy duty anti-tamper hinges, internal lever action handle four point dead bolt lock openable from inside at all times • 1 hour fire rated
Walls	Equal to – • Reinforced concrete masonry • 200mm nominal thickness • 1 hour fire rated
Ceiling	Equal to – • Reinforced concrete or secure fire rated • 1 hour fire rated

Category B

Areas requiring high security for the storage of valuable materials and equipment, paints and low hazard materials.

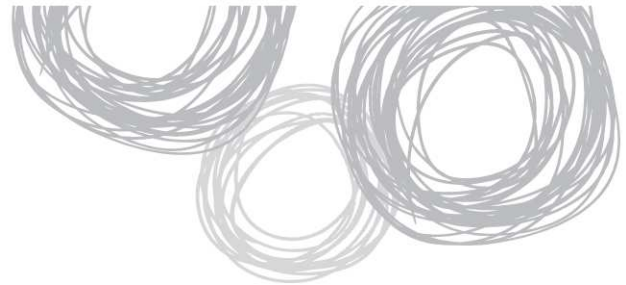| Windows	Equal to- • High level – above 1800mm • Obscure glazing • Steel security mesh or welded steel bars installed with anti-tamper screws on all sections of glass • Where welded steel bars are utilised, install key operated push button plunger locks
Doors	Equal to – -45mm solid core with: • 1.2mm steel faced • 1.2mm Steel frame concrete filled • Heavy duty anti tamper hinges • Quality lock with dead latch with internal lever action handle openable from the inside at all times • Steel striker plate cover fitted (eg. Boyd)
Roller Door (if required)	Equal to – -Industrial strength roller door with: • Separate steel segments • 50mm (min) side guides • Centre hook and sliding bar lock • Bottom of roller door to be strengthened with 100mm x 25mm

	boxed aluminium
	• Internal barrel bolts to each side allowing for the fitting of padlocks
Walls/Ceiling	Equal to – • Solid or core filled concrete masonry 150mm nominal thickness or • Stud frame with 12mm compressed fibre cement sheeting to one side • Steel mesh/sheeting above walls reaching to roof height or steel mesh/sheeting across ceiling level to prevent access through ceiling. Refer Sect 9.1

Category C in Medium, High and Extreme risk schools

Areas requiring high security for housing highly valuable or attractive equipment

Windows	Equal to – • Aluminium frame - where sliding windows installed anti-lifting blocks must be fitted • Steel security mesh or welded steel bars installed with anti-tamper screws on all sections of glass • Where welded steel bars are utilised, install key lockable push button plunger locks • Window handles fixed centrally • Laminated glazing. Refer Sect 9.1
Internal Doors	Equal to – • Quality solid core in quality frame • Quality lock with dead latch with internal lever action handle openable from the inside at all times
External Entry Doors	Equal to – -45mm solid core with: • Heavy duty anti tamper hinges • Where glass viewing panel is installed, cover glass with steel security mesh secured with anti tamper screws. • Quality lock with dead latch with internal lever action handle openable from the inside at all times • Steel striker plate cover fitted (eg. Boyd) • Anti tamper hinges **Additional for canteens as below** • Welded steel grille door comprising steel security mesh screen installed with anti-tamper screws with Triple Lock mechanism
Roller Doors and Canteen Servery Doors	Equal to industrial strength roller door with - • Separate steel segments • Minimum 50mm side guides • Padlockable internal sliding bar lock • Bottom of roller door to be strengthened with 100mm x 25mm boxed aluminium • Internal barrel bolts to each side allowing for fitting of padlocks Installation of security bars to exterior of roller shutters is optional. Construction to be in a fixed frame with a "servery" provision immediately above the counter.
Walls	Standard construction
Ceilings	Standard construction, secure ceiling space between rooms

Category C in Very Low & Low risk schools

Areas requiring high security for housing highly valuable or attractive equipment

Windows	Equal to – • Aluminium frame - where sliding windows installed anti-lifting blocks must be fitted • Steel security mesh or welded steel bars installed with anti-tamper screws on sliding sections of window and over glass within 900mm of door handles • Where welded steel bars are utilised, install key lockable push button plunger locks • Window handles fixed centrally • Laminated glazing. See Sect 9.1
Internal Doors	Equal to – • Quality solid core in quality frame • Quality lock with dead latch with internal lever action handle openable from the inside at all times
External Entry Doors	Equal to – -45mm solid core with: • Heavy duty anti tamper hinges • Where glass viewing panel is installed, cover glass with steel security mesh secured with anti tamper screws. • Quality lock with dead latch with internal lever action handle openable from the inside at all times • Steel striker plate cover fitted (eg. Boyd) • Anti tamper hinges **Additional for canteens as below** • Welded steel grille door comprising steel security mesh screen installed with anti-tamper screws with Triple Lock mechanism
Roller Doors and Canteen Servery Doors	Equal to industrial strength roller door with - • Separate steel segments • Minimum 50mm side guides • Padlockable internal sliding bar lock • Bottom of roller door to be strengthened with 100mm x 25mm boxed aluminium • Internal barrel bolts to each side allowing for fitting of padlocks Installation of security bars to exterior of roller shutters is optional. Construction to be in a fixed frame with a "servery" provision immediately above the counter.
Walls	Standard construction
Ceilings	Standard construction, secure ceiling space between rooms

Category D in Medium, High and Extreme risk schools

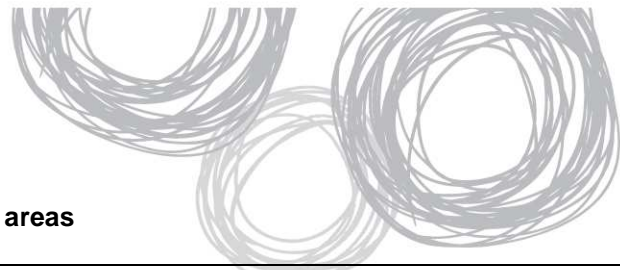Areas that require moderate security for general teaching areas housing small quantities of valuable equipment.

Windows	Equal to – • Aluminium frame - where sliding windows installed anti-lifting blocks must be fitted • Steel security mesh with anti-tamper screws covering sliding section of window • Steel security mesh with anti-tamper screws covering to glass within 900mm of door handles • Window handles fixed centrally • Insect screens (Food preparation areas only)
Internal Doors	Equal to – • Quality solid core in quality frame
External Entry Doors	Equal to – 45mm single leaf solid core with: • Heavy duty anti tamper hinges • Quality lock with dead latch with internal lever action handle openable from the inside at all times • Steel striker plate cover fitted (e.g. Boyd) • Where glass viewing panel is installed, cover glass with steel security mesh secured with anti tamper screws Or • Single leaf aluminium framed glass pedestrian door. Glass protected by steel security mesh secured with anti tamper screws • Steel striker plate cover fitted (e.g. Boyd) • Anti tamper hinges • Quality lock with internal lever action handle openable from the inside at all times
Walls	Standard construction
Ceilings	Standard construction

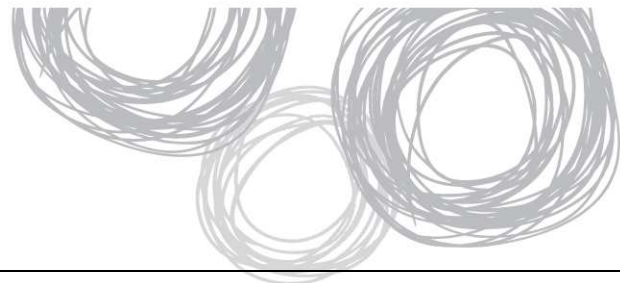**Category D in Very Low & Low risk schools**

Areas that require moderate security for general teaching areas housing small quantities of valuable equipment.

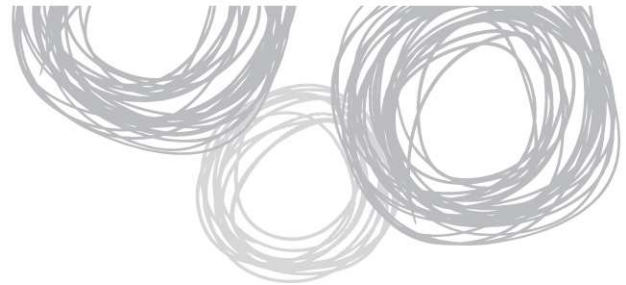| Windows	Equal to – - Aluminium frame - where sliding windows installed anti-lifting blocks must be fitted - Key lockable push button plunger locks - Steel security mesh with anti-tamper screws covering to glass within 900mm of door handles - Window handles fixed centrally
Internal Doors	Equal to – Quality solid core in quality frame
External Entry Doors	Equal to – 45mm single leaf solid core with: - Heavy duty anti tamper hinges - Quality lock with dead latch with internal lever action handle openable from the inside at all times - Steel striker plate cover fitted (e.g. Boyd) - Where glass viewing panel is installed, cover glass with steel security mesh secured with anti tamper screws Or - Single leaf aluminium framed glass pedestrian door. Glass protected by steel security mesh secured with anti tamper screws - Steel striker plate cover fitted (e.g. Boyd) - Anti tamper hinges - Quality lock with internal lever action handle openable from the inside at all times
Walls	Standard construction
Ceilings	Standard construction

Category E in Medium, High and Extreme risk areas

Windows	Equal to – • Key lockable push button plunger locks (keyed alike) • Steel security mesh with anti-tamper screws covering to glass within 900mm of door handles • Steel security mesh with anti-tamper screws covering sliding section of windows • Window handles fixed centrally • Laminated glazing
Internal Doors	Equal to – • Quality solid core in quality frame
External Entry Doors	Equal to – 45mm single leaf solid core with: • Heavy duty anti tamper hinges • Quality lock with dead latch with internal lever action handle openable from the inside at all times • Steel striker plate cover fitted (e.g. Boyd) • Where glass viewing panel is installed, cover glass with steel security mesh secured with anti tamper screws Or • Single leaf aluminium framed glass pedestrian door. Glass protected by steel security mesh secured with anti tamper screws • Steel striker plate cover fitted (e.g. Boyd) • Anti tamper hinges • Quality lock with internal lever action handle openable from the inside at all times
Electronic Security	Alarm system to meet current DET electronic security specifications
Miscellaneous	• Anti tamper screws for fence panel fixings • Anti climb barriers on shade cloth structures • Anti tamper taps to turn water off to veranda water troughs

**Category E in Very Low & Low risk areas**

|	
Windows	Equal to – • Aluminium frame - where sliding windows installed anti-lifting blocks must be fitted • Key lockable push button plunger locks (keyed alike) • Steel security mesh with anti-tamper screws covering to glass within 900mm of door handles • Window handles fixed centrally • Laminated glazing
Internal Doors	Equal to – • Quality solid core in quality frame
External Entry Doors	Equal to – 45mm single leaf solid core with: • Heavy duty anti tamper hinges • Quality lock with dead latch with internal lever action handle openable from the inside at all times • Steel striker plate cover fitted (e.g. Boyd) • Where glass viewing panel is installed, cover glass with steel security mesh secured with anti tamper screws Or • Single leaf aluminium framed glass pedestrian door. Glass protected by steel security mesh secured with anti tamper screws • Steel striker plate cover fitted (e.g. Boyd) • Anti tamper hinges • Quality lock with internal lever action handle openable from the inside at all times
Electronic Security	Alarm system to meet current DET electronic security specifications
Miscellaneous	• Anti tamper screws for fence panel fixings • Anti climb barriers on shade cloth structures • Anti tamper taps to turn water off to veranda water troughs

APPENDIX 3

Locations for Intruder Detection Devices

Block	Function	Device
Administration	All Offices, Reception, Resource and Reprographics Rooms, Computer/SMS Rooms, Meeting Rooms, Interview Rooms, Staff Room, Bulk Stores	Motion detection
	Secure Stores	Reed Switch
	Reception, Money Handling Rooms	Duress button
Prep Blocks	All Offices, Staff Rooms , General Learning Areas, Practical Learning Areas, storerooms, Preparation Areas, Withdrawal Rooms	Motion detection
	Storage Area External Doors	Reed Switch
General Teaching and Special Education Blocks	All Offices, Staff Rooms and Offices, Teacher Preparation Areas, General Learning Areas, Resource Stores, Computer Room, Withdrawal Rooms, Wet/Dry Areas	Motion detection
Music Blocks	All Classrooms, storerooms, preparation areas and offices	Motion detection
Resource (Library) Blocks	Reading Areas, Book Shelving, Resource Stores, Computer Areas, Audio/Visual Rooms, Loans Desk Area, Teacher Preparation Areas, Staff Rooms and Offices, Work Rooms	Motion detection
	Secure Stores	Reed Switch
Tuckshops / Canteens	Serving Areas, Preparation Areas, Uniform Storage and Sales, Stationery Storage and Sales	Motion detection
	Servery Counter Shutters	Reed Switch
Activity Halls	Staff Rooms, Sports Equipment Storage, A/V Equipment Storage, Lighting Equipment, Kitchens	Motion detection
Manual Arts Blocks	Staff Rooms and workshops	Motion detection
	Secure Stores, Spray Paint Booths, Flammable Liquid Stores	Reed Switch
Performing Arts Blocks	All Classrooms, A/V Equipment Storage, preparation areas and offices, Lighting Equipment	Motion detection
Home Economics Blocks	All classrooms, Staff Rooms, Kitchens, Food and equipment Storage Areas	Motion detection
Commerce Blocks	All classrooms, Staff Rooms, Computer Rooms, Model offices	Motion detection
	Secure Stores	Reed Switch
Art Blocks	All classrooms, Staff Rooms, Paint and Equipment Storage, Media / Graphics Rooms, Darkrooms	Motion detection
Science Blocks	All classrooms, Staff Rooms, A/V Equipment Storage, Preparation Rooms, Chemical Storage	Motion detection
General Studies Blocks	All classrooms, Staff Rooms, A/V Equipment Storage	Motion detection
	Secure Stores	Reed Switch
Staff Amenities Blocks	All classrooms, Staff Rooms and offices	Motion detection
Ancillary Staff Blocks	All Offices, store rooms and workshops	Motion detection
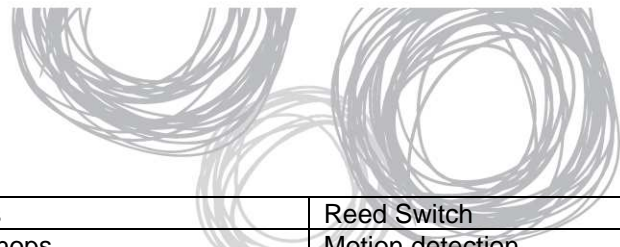
	Chemicals / Fuel Stores	Reed Switch
Agricultural Units	Staff Rooms and workshops	Motion detection
	Grounds Equipment Sheds and chemical/fuel stores	Reed Switch
Swimming Pools	Canteens	Motion detection
	Plant Rooms and Chemical Stores	Reed Switch
Sheds	Physical Education Storage, Grounds Equipment Storage, Prep Storage	Reed Switch
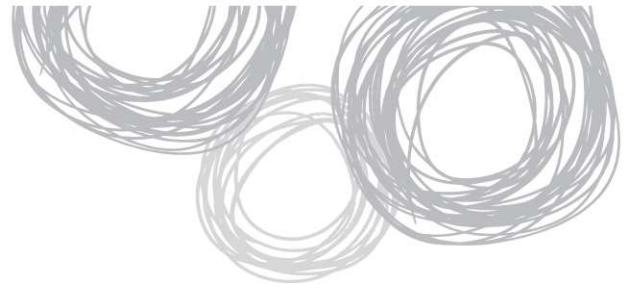
APPENDIX 4

Locations for Fire and Smoke Detection Devices

Block	Function	Device
Administration		
	Corridors	Smoke detection
	Computer/SMS Rooms	Smoke detection
	Duplicating Rooms	Smoke detection
Resource (Library) Blocks		
	Book Shelving	Smoke detection
	Computer Areas	Smoke detection
	Audio/Visual Rooms	Smoke detection
	Work Rooms	Smoke detection
Practical Studies Blocks		
	Workshops	Smoke detection
	Spray Paint Booths	Fire detection
	Flammable Liquid Stores	Fire detection
	Kitchens & Food Preparation areas	Fire Detection

Note: Coverage of the fire detection system may extend to additional buildings if considered to be at high risk by design consultant.