School Closed Circuit Television (CCTV) requirements

This document outlines requirements for hardware and installation of closed circuit television (CCTV) at state schools. These requirements are designed to assist schools ensure CCTV hardware fulfils its intended purpose while also adhering to applicable Australian Standards and the DoE Network Infrastructure Procedures and Standards.

For information about where CCTV can be installed, school's responsibilities in managing CCTV, and how footage can be collected and shared, refer to the Department of Education (DoE) CCTV use in schools procedure.

1. General requirements

- CCTV systems in schools are to record to a network video recorder (NVR) via internet protocols (IP) on Ethernet fibre. Cloud based systems are not to be installed.
- CCTV systems can utilise existing spare fibre backbone cores in the school's data racks to facilitate a direct physical connection between blocks.
- CCTV equipment shall not be connected via an active network link to any other DoE equipment and shall not utilise the school's Ethernet network to transmit or store data, or communicate with any source or destination. Separate rack mountable power over Ethernet (POE) switches must be installed for CCTV (more information about network infrastructure requirements can be found in Section 4).
- Where no spare fibre cores are available for use with CCTV equipment, assistance for proposing an acceptable solution should be sought from the school based Technical Officer, the relevant Regional Systems Technician, and DoE Network Design (network.design@qed.qld.gov.au). Details of any proposed solution must be detailed in writing for review and approval.
- CCTV systems are to be comprised of fixed cameras. Pan tilt zoom (PTZ) system controls are not to be installed.
- Systems are to have inbuilt alarm trigger options for motion detection, tampering alarm, network communications failure, illegal login, HDD full, and HDD error.
- Molex certified Cat6A network points are to be installed for CCTV cameras where there are no existing spare network points. Orange coloured Molex Certified Cat6A patch leads are to be used.
- CCTV systems are to be installed in accordance with:
    - AS/NZS 62676: Video surveillance systems for use in security applications
    - AS 3000: Electrical installations (Wiring rules)
    - DoE Network Infrastructure Procedures and Standards (DNIPS)
- All CCTV equipment is to be installed as per manufacturer specifications.
- Where systems are expanded, or existing cameras are being integrated to a new system, all cameras are to be migrated to record to a single compatible NVR wherever possible.

2. Cameras

- Wherever possible, cameras are to be installed above 2400mm and below 5000mm above fixed floor level (AFFL).
- All cameras installed lower than 3000mm AFFL are to have a vandal protection level of IP67/IK10.
- Cameras are to have inbuilt alarm trigger options for motion detection, tampering alarm, network communications failure, illegal login, HDD full, and HDD error.
- Cameras are to be set to record a minimum of 12.5 frames per second (fps) on motion, and continuously at a minimum of 2.5fps.
- Cameras should not be angled to directly face lighting or sunlight.

Camera types

The table below gives an overview of the types of CCTV cameras that should be used for application at a school:

Area	Example	Camera Type
Where camera is indoors	Admin counter	Bubble Dome
Where camera is outdoors, viewing an area between buildings, less than 3000mmm AFFL	Walkways, block exterior, common areas, installed 2400mm-3000mm AFFL	Vandal Proof Dome Camera
Where camera is outdoors, viewing an area between buildings, installed 3000mm-5000mm AFFL	Walkways, block exterior, common areas, installed 3000mm-5000mmm AFFL	Turret Camera
Viewing a large area/open space	Car park/fence line/blocks from a distance (i.e. sheds)	Varifocal Turret/Dome Camera
Where camera is outdoors, viewing an area between buildings, and connected via coax	Walkways, block exterior, common areas, where no fibre is available and connection is via coax cable	Vandal Proof TVI

Table 1: Types of CCTV cameras to be used

Minimum requirements for cameras

The table below shows the minimum requirements for the camera types listed above:

Camera Type	Resolution	Infrared	Lens
Bubble Dome	6MP	Up to 10m	2.8mm
Vandal proof dome camera	6MP	Up to 30m	2.8mm
Vandal proof turret camera	6MP	Up to 30m	2.8mm
Varifocal turret camera	6MP	Up to 30m	2.8mm-12mm varifocal
HD-TVI output camera	5MP	Up to 30m	2.8mm

Table 2: Minimum requirements for CCTV cameras

3. Recording and viewing

Recording

- CCTV systems should include installation of two (2) data rack mountable network video recorders (NVR). NVRs are to be properly installed and secured in data racks. One NVR should be located in the centre of network (CoN) in a lockable cabinet/room which is covered by the school intruder detection system. The second NVR is to be installed in a rack which is:
    - In a separate block to the CoN;
    - In a room that is secured whenever not in use (including business hours), and covered by the school intruder detection system.
- NVRs are to:
    - Be compatible with the IP protocols of system cameras, and capable of supporting the required resolution;
    - Have sufficient channels/licenses for expansion;
    - Have sufficient storage to record at least 31 days of footage at the recommended frame rates as specified in Section 2.

A guide for suitable NVR capacity is below:

Number of Cameras	NVR Capacity
0-10	16 channel/license
10-25	32 channel/license
Above 25	64 channel/license

Table 3: NVR Capacity guide

Monitoring station

- Monitoring stations for CCTV are to be set up as a password protected login system. Monitoring station hardware is to be installed in a room that is secured when not in use (including during business hours).
- Monitoring stations should be dedicated to CCTV equipment only and not connected on the school ICT network.

4. Network and infrastructure

- Unless specified below, all works are to comply with the DoE Network Infrastructure Procedures and Standards (DNIPS) v3.0 Part A and Part B. The applicable Regional Systems Technician is to be advised of any proposed deviations, and details in writing must be directed to DoE Network Design (network.design@qed.qld.gov.au) for review and approval.
- CCTV equipment can utilise spare fibre backbone cores to facilitate a direct physical connection between blocks.
- CCTV equipment shall not be connected via an active network link to any other DoE equipment and shall not utilise the school's Ethernet network to transmit or store data, or communicate with any source or destination.
- Where no spare fibre cores are available for use with the CCTV equipment, assistance for an acceptable solution should be sought from the school based Technical Officer and the relevant Regional Systems Technician and DoE Network Design (network.design@qed.qld.gov.au). Details of any proposed solution must be detailed in writing for review and approval.
- CCTV infrastructure is to be properly mounted and secured in available space within data racks as per manufacturer specifications.

- All equipment, cables and fibre patch leads are to be labelled as 'CCTV'. Labelling must be sufficient so that all cables and leads can be easily reconnected if disconnected inadvertently.
- Orange coloured Molex Certified Cat6A patch leads are to be used (all cabling which forms part of a school building's copper horizontal sub-system must be Cat6A).
- All applicable standards and procedures for cable management must be adhered to.
- Dispensation has been provided by DoE Network Design for the use of single Cat6A outlets for CCTV cameras only.
- Inter-building/structure extension of the copper horizontal subsystem for CCTV is not permitted.

Centre of Network

- The following is to be installed in the school centre of network (CoN), or where the primary NVR is to be located if not in the CoN:
    - Primary NVR
    - Fibre switch/ Core Switch
    - Rack mountable POE switch (for any cameras running from the applicable block)
    - Rack mountable UPS capable of delivering minimum 2 hours power
    - Cat6A patch panel (if required)

Network Data Racks

- The following is to be installed in the data rack of each block where CCTV cameras will be installed on the building:
    - Rack mountable POE switch
    - Cat6A patch panel (if required)
    - Rack mountable UPS capable of delivering minimum 2 hours power
    - TVI/HDCVI encoder where any cameras are to be connected via coaxial cable
    - Secondary NVR (at one block where applicable as per Section 3)
- Where there is no available space in data cabinets, particularly the CoN, for the necessary CCTV equipment, advice must be sought from the relevant Regional Systems Technician, and DoE Network Design (network.design@qed.qld.gov.au). Details of any proposed solution must be detailed in writing for review and approval.

5. Physical Installation

- Cameras are to be securely affixed as per manufacturer's specifications. Camera housing, mounts, and cabling are to be sealed to prevent intrusion by insects, vermin or weather.
- Cameras should be installed with the manufacturer's relevant junction box mount. Wall mount or pendant mount brackets should only be used to avoid obstacles in the camera view where no other option for camera location exists. Junction boxes should be opaque, and have no viewing window showing the data point.
- Cabling should be kept internal to walls and ceiling spaces wherever practicable. Where conduit is required for cabling, rigid white communications conduit should be used with double sided hot dip galvanised steel saddles affixed every 300mm. Adequate mechanical protection should be installed for all conduit and enclosures.
- Any non-working/'dummy' cameras/empty housings are to be decommissioned and completely removed.
- Installation of any equipment on asbestos is to be carried out in accordance with the school Asbestos Register, and the installer's Safe Method Working Statement (SWMS).

- Any area where decommissioned cameras have been removed is to be repaired accordingly.

Poles installed for CCTV

- To manage cost of installation and maintenance, CCTV on poles should be avoided wherever possible.
- Before any poles for CCTV are considered, the relevant Regional Infrastructure Advisor should be consulted.
- CCTV poles are to be installed at least 1500mm from any building or climbable structure (outdoor furniture, trees etc.).
- Prior to commencing work installing any poles for CCTV, the installer is to determine the location of all underground services such as water, gas, electricity and communication pipes or lines by engaging an authorised service locator.
- Prior to installation of a pole within 1000mm of any underground service, consent of the applicable service provider must be obtained.
- The installer is to ensure any services, surfaces and finishing damaged during course of construction are reinstated as part of the project, at the contractor's expense.

6. Testing & Commissioning:

- On completion of installation works, the installer is to:
    - Ensure the fields of view and focus (during daytime and night time) for each camera is set correctly.
    - Test camera live view, playback and the transfer of footage functionality.
    - Provide training to appropriate school personnel demonstrating system operation, playback and transfer of footage to media storage.

Documentation

- The following installation documentation is to be forwarded to the school/project manager upon completion:
    - Camera positons
    - Relevant IP Addresses
    - NVR and monitoring station locations
    - Installed fibre/POE/Cat 6A switches, UPS and encoders
    - Camera and NVR user manuals
    - A signed and completed Training Certification form
    - A signed and completed Telecommunications Customer Cabling (TCA1) form
    - Cabling warranty and certification
    - Cable route and network point positions
    - Operation instruction sheets and user credentials with passwords

7. Quotation & Costing

Quotes from installers should include at least two (2) options for system components as per the table below:

Equipment	Options
Cameras	Vivotek, Bosch, Axis (or equivalent as per requirements in Section 2)
NVR	Vivotek, Bosch, Axis, Avigilon, (or equivalent as per requirements in Section 3)

Table 4: Quote brand options with examples

- Quotes should include itemisation of costs which specify:
  - Types and quantities of required equipment, and;
  - Labour and travel as individual amounts.

For more information about CCTV, contact the relevant School Security Advisor or Emergency & School Security at ISD.EmergencySecurity@qed.qld.gov.au.