

CCTV System Survey & Feasibility Report

Report produced following site survey at
Cotham School, Cotham Lawn Road, Bristol BS6 6DT

Prepared by

Andrew Williams

of



Sutton Yard
Sutton Hill Road
Bishop Sutton
Bristol
BS39 5UR



Version 1.6
15th October 2024

VERSION / CHANGE HISTORY

Date	Version	Detail	Revised by	Reviewed by
2 nd June 2024	DRAFT	Initial Draft for Comment	AW	
20 th June 2024	V1.1	Amend column types	AW	
30 th July 2024	V1.2	Finalise locations	AW	
2 nd August 2024	V1.3	Additional Duct Details	AW	
9 th August 2024	V1.4	Privacy Zone Details	AW	
15 th October 2024	V1.5	Camera location adjustment	AW	
15 th October 2024	V1.6	Camera location adjustment	AW	

Contents

- VERSION / Change History 2
- 1 INTRODUCTION / PREAMBLE 4
- 2 CCTV SYSTEM RISK ASSESSMENT 4
- 3 SURVEY FINDINGS 4
- 4 COTHAM SCHOOL FIELDS CCTV PLANS 6
- 5 GLOBAL MSC RECOMMENDATIONS 10
- 6 SPECIFICATION FOR ADDITIONAL CCTV EQUIPMENT AT COTHAM SCHOOL 11
- 7 EQUIPMENT SELECTION 11
- 8 INSTALLATION STANDARDS 14
- 9 PRIVACY CONSIDERATIONS 14
- 10 CERTIFICATION 14
- 11 MAINTENANCE 14
- 12 EQUIPMENT SELECTION 14

1 INTRODUCTION / PREAMBLE

Ed Carpenter of Cotham School engaged the services of specialist security consultant Global MSC Security to undertake a survey and feasibility study to explore the possibilities and budget costs associated with the installation of additional CCTV cameras in the grounds of the school to provide coverage of the boundary area to the north and west boundaries of the school playing fields.

The objective is to establish outline specifications including performance specifications for the new cameras and for the new cameras to be included within the existing site-wide Avigilon CCTV System

2 CCTV SYSTEM RISK ASSESSMENT

In line with the National Security Inspectorate (NSI) requirements, we are required to undertake a Risk Assessment to determine the weaknesses with regards to the requirement from a CCTV perspective.

There is a risk that school children may leave the school grounds via the boundary walls, there is a wider risk that unauthorised persons may enter the school playing fields via the boundaries, or illicit substances may be passed into the school grounds, or school property may be passed out of the school grounds across the boundaries

A considered implementation and use of a CCTV equipment can complement the existing CCTV System and other security systems by providing additional CCTV coverage of persons approaching the main school buildings from the playing fields.

The CCTV system is generally re-actively monitored rather than pro-actively monitored and so the proposed new CCTV cameras will be recorded onto the existing CCV NVR Recording Appliance Servers (which may need to be expanded to accommodate the additional CCTV Streams form the proposed new cameras

3 SURVEY FINDINGS

Andrew Williams from Global MSC Security undertook a survey on 22nd May accompanied by Mr Carpenter.

There is already a high-quality Avigilon CCTV System installed providing relatively comprehensive coverage of the school grounds, the existing system currently consists of 179 channels of video signals, many of which are actually multi-sensor units, with three or four individual cameras H4 camera units. The CCTV Cameras are connected to a number of NVR recording appliances within the schools IT / Comms Room via the schools IT network. The CCTV Camera images (live and recorded) are viewed with the Avigilon ACC 7.14.30.12 (soon to be updated) which is a relatively current version of the software.

Global MSC would recommend that whilst any ONVIF compliant cameras could be used to extend the current CCTV System, as the existing system uses extensively Avigilon cameras, then any new cameras should ideally be Avigilon units – this provides uniformity, consist, ease of use, maintenance and repair.

There is Cat5/6 network cabling installed throughout the school to accommodate the schools various IP systems and also supports the existing CCTV system. It is anticipated that the new cameras will be connected via the schools IT network to the central recording servers, extended out to the new camera locations.

The areas requiring coverage pose several challenges;-

- Network transmission / connectivity from the ideal camera positions back to the school IT infrastructure,
- Visual obstructions presented by trees,
- Method of providing power for the proposed new cameras,
- Privacy concerns for nearby domestic and business residences,

We believe that the inclusion of three new Avigilon Multi Sensor camera units, each with three internal camera modules mounted on three new wind-down CCTV columns within the school grounds (please see proposed camera location Plan, Section 4) can provide adequate trap protection across the fields and along a virtual boundary within the school grounds.

There is an existing duct running from the main school building across the school field Cotham Lawn Road which can hopefully accommodate the transmission cabling for the three additional cameras.

A method of 'mole ploughing' to lay a 50mm / 2" duct below the field surface to link the proposed new camera positions to the existing duct network / school buildings.

Each proposed new camera would be installed on a 4meter tall wind-down CCTV column, each of these columns would require a concrete base to be constructed below the finished surface floor / field level to support the tind-down column.

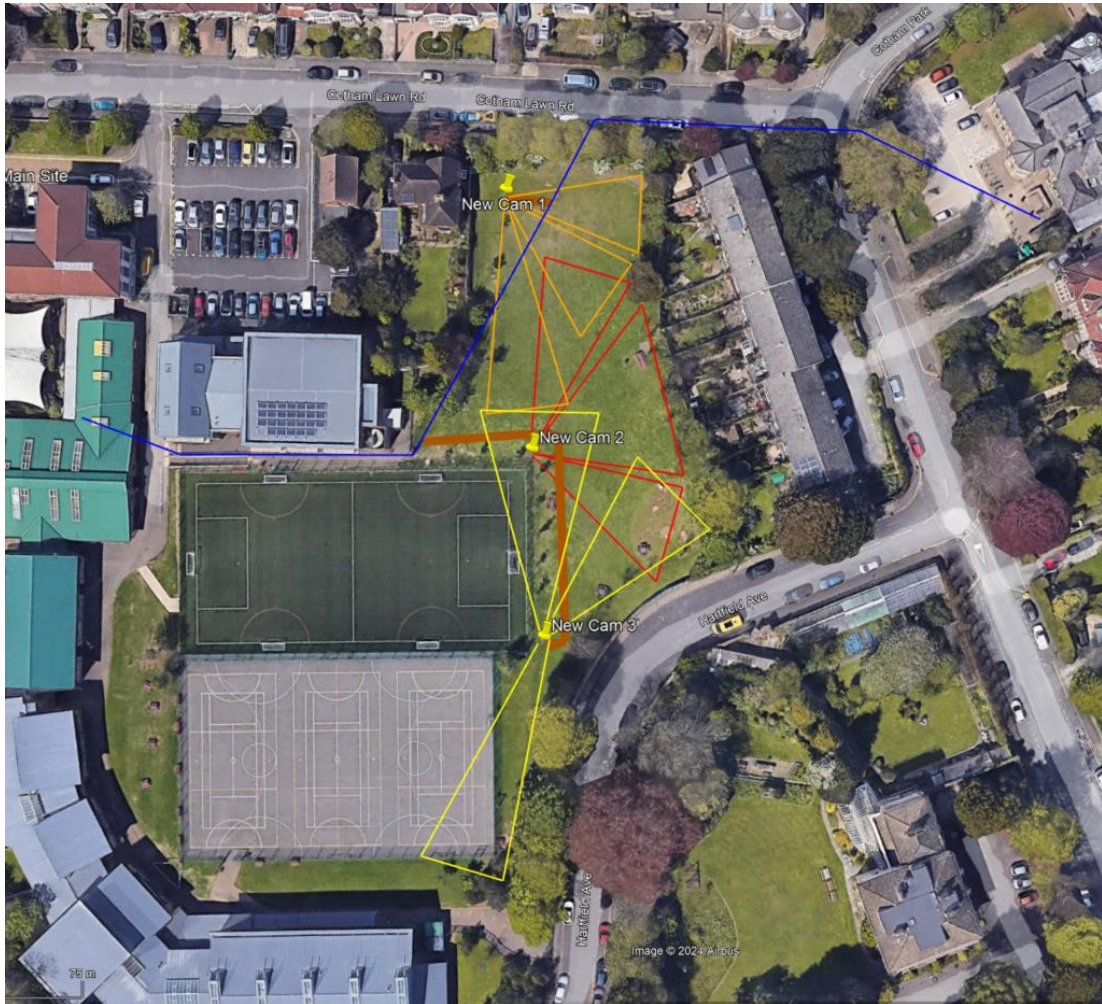
Each of the proposed new cameras can be powered via PoE (power over ethernet) and whilst the overall cable length would be in excess of the 90m prescribed for Ethernet design rules, it is possible to use a number of Ethernet and PoE Extender units to provide power and network transmission from each of the cameras back into the main school building for connection to a PoE+ enabled network switch ports. A ruggedised / duct grade CAT6 cable would be run through the new 'mole-ploughed' duct from the camera locations to the main school building. The IT provided network ports can be restricted by the schools IT team so as to reduce the risk to network security.

An alternative method of transmission for the three proposed new cameras would be the use of fibre optic cable and media converters, however there would then be the need to provide mains 2

30v power at each camera location, with the cost of provisioning the main supplies and fibre optic cable being substantially more expensive than the use of CAT6 cable and Ethernet Extender units
The images from the new cameras (in the form of data) will be configured to be recorded on the existing schools IPCCTV NVR Recording Appliances – additional hard drive storage may be required

to accommodate the additional cameras in order to maintain the schools prescribed retention period and recording quality requirements.

4 COTHAM SCHOOL FIELDS CCTV PLANS



New Cam 1, New Cam 2 & New Cam 3 locations have been decided so as to take into consideration proximity to trees / roots, domestic residences, bat surveys etc. (Existing duct route indicated in Blue, proposed new cable routes indicated in Brown).

Proposed New CAM 1



(Existing duct route indicated in Blue, proposed new cable routes indicated in Brown).

Proposed New Cam 2



(Existing duct route indicated in Blue, proposed new cable routes indicated in Brown).

Proposed New Cam 3



(Existing duct route indicated in Blue, proposed new cable routes indicated in Brown).

5 GLOBAL MSC RECOMMENDATIONS

In order to determine the CCTV system required for this application, we have developed the Operational Requirements for the system based on a standard premises CCTV security strategy, this is as follows:-

- 1) To provide CCTV coverage to operate primarily within daylight hours, but also 24/7 in day/night conditions to cover the approach to the school from the boundary across the school fields to enable the client to **detection** and **observe** activity in the area. Supplementary lighting may be required during hours of darkness – this could be achieved by the use of IR lighting added to the cameras, however the power required to drive the IR illumination must be considered and factored into the interconnecting cabling.
- 2) To provide CCTV coverage to the approach to the main building from the perimeter fields / grounds to enable the client to **detection** and **observe** activity in these areas.

This is based upon the industry definitions of DORI:-

- **Detection** - The detection level allows for reliable and easy determination of whether a person or vehicle is present, (where a person or object fills 20% of the screen height).
- **Observation** - The observation level gives characteristic details of an individual, such as distinctive clothing, while allowing a view of activity surrounding an incident, (where a person or object fills 40-50% of screen height).
- **Recognition** - The recognition level determines with a high degree of certainty whether an individual shown is the same as someone that has been seen before, (where a person or object fills 70-80% of the screen height).
- **Identify** - The identification level enables the identity of an individual beyond a reasonable doubt, (where a person or object fills 90-120% of screen height)

In order to achieve general Observation surveillance of the perimeter of the school fields whilst achieving the ability to recognise or identify persons at close proximity to the cameras, specific cameras are usually required to fulfil each of these objectives, so two or three cameras may be required at some areas, with each camera specifically setup and configured to provide the required views.

Due to the tree cover and the night-time lighting conditions, consideration could be given to equipping the proposed new cameras with IR capabilities, a determining factor is whether or not it is anticipated that incidents of interest are likely to occur during the hours of darkness.

All cameras to be equipped with a level of intelligent video analytics so that movement may be identified by the CCTV camera system and an alert generated to the client to warn them of activity inside the field of view of the cameras.

Due to the proximity of the cameras to neighbours, the use of Privacy Screening may be necessary.

6 SPECIFICATION FOR ADDITIONAL CCTV EQUIPMENT AT COTHAM SCHOOL

The existing Avigilon CCTV equipment provides a high quality, enterprise class CCTV system

The following specification is for the extension works required to provide a suitable CCTV equipment, which will comply with NSI Code of Practice NCP104 for the design, installation and maintenance of video surveillance systems.

The system has been designed to comply with the latest standards and to comply with GDPR regulations

A Risk Assessment has been carried out in order to provide a security system commensurate to the perceived risks.

7 EQUIPMENT SELECTION

Please see Section 4 of this document

Camera Equipment

The Avigilon H5AMH Multi Sensor camera is a modular camera that can come with three or four internal camera modules which can be tailored to suite the individual needs of each application.

For the School fields, we recommend the following Avigilon camera assembly and modules;-



The Avigilon H5AMH-AD-PEND1 (pendant mount for swan neck / CCTV column installation)

The Avigilon H5AMH-D0-COVR1 (clear dome cover)

The Avigilon IRPTZ-MNT-NPTA1 (pendant – swan neck adapter)

The Avigilon 15C-H5A-3MH (Camera insert with 3 x 5MP camera module)

*OPTIONAL AvigilonH4AMH-AD-IRL1 (infra-red module)

Avigilon ACC camera licenses.

This Avigilon CCTV Camera unit is fully featured with multiple privacy zone options to comply with GDPR requirements and data protection impact assessments

* If you require the Infra red module, consideration must be given to the power source for the IR units.

CCTV Column

The Altron AW1859/TD/UP is a wind-down CCTV column that will be painted RAL 6006 (Moss Green) or to a colour of your choice.

The use of a tilt down column negates the need for access equipment (such as a vehicle mounted elevated platform) to need to drive across the fields for routine maintenance or service calls in the future.

The AW series of CCTV columns is equipped with a small equipment cabinet in the base of the column for cable connections etc. and can be painted to your specification.

The Altron AW1699F Swan Neck bracket is bolted to the top of the CCTV column and provides the ideal pendant mounting for the Avigilon camera.



The CCTV column requires a concrete base to be constructed below the field surface to support the column and to provide cable entry into the column cabinet from beneath via a duct constructed within the base, (the base minimum dimensions / volume should be 1.1m x 1.1m x 0.55m).

CCTV Transmission Methodology

There are several ways in which the CCTV signals can be transmitted between the camera equipment and the central recording, control and monitoring equipment, with varying degrees of costs and complexity. Another factor to consider is how power is delivered to the cameras.

The traditional method of power and transmission would require armoured mains supply cable and fibre optic cables to be run to each camera location from one of the main buildings – this is the best method but is most costly and disruptive.

Our recommendation is to employ the use of Power over Ethernet (PoE) over CAT6 cable using Ethernet extender units to overcome the 90m Ethernet cable distance rule.

We recommend the Veracity Longspan network range expander with PoE capabilities, such as the VLS-1P-B and VLS 1P-C units. Careful consideration should be given to minimising cable lengths as even though these extender units can extend the ethernet network up to 600 meters, the longer the cable run the less PoE power will be available at the camera locations – this may only be a concern if you opt for the addition Infra-Red illuminators for the cameras.



Standard duct grade CAT6 cable can be used for the CCTV camera signal transmission and power delivery saving a considerable cost over using fibre optic cable and steel wired armoured mains cables.

(Several other ethernet expanders are available on the market with PoE capabilities, such as AMG, Ubiquity Pearle etc so you may choose a manufacturer or supplier you are most comfortable with and will also provide the same discrete installation as the LongSpan units.)

The use of this method of transmission and power delivery only requires a small duct network, such as the use of 'mole-ploughing' duct installation which has minimal impact on the fields and is relatively quick and very cost effective. This delivers a 50mm / 2" duct through 'soft dig' areas ideal for the Cotham School requirement.

There is already a partial duct route through the field adjacent to the proposed new cameras, our plan (Page 6 of this document) outlines the proposed additional duct route provided using mole-ploughing techniques indicated as a brown line on the plan.

NOTE

- It may not be possible to install cameras at all of these locations due to the challenges in installing the cables and other conditions, such as trees, bats, privacy etc.
- If this scheme is to go ahead, a data protection impact assessment should be carried out to identify any potential privacy infringement that may occur and also to identify measure that can be taken to mitigate them.
- If Infra-Red illumination is required, careful consideration to cable lengths must be given.

Monitoring, Control & Recording Equipment

The existing Avigilon CCTV control system may need to be expanded to accommodate the additional camera streams – this may require additional ACC-ENT camera licenses and / or additional hard drive storage in order to maintain the current recording duration and quality for the existing cameras as well as accommodating the new cameras.

8 INSTALLATION STANDARDS

The system is to be installed in compliance with BS EN 62676-4, NSI NCP104, latest version of BS7671 - 18th edition IET Wiring Regulations. Detailed method statement and risk assessment to be provided before works commence.

9 PRIVACY CONSIDERATIONS

During the process to determine the camera locations, consideration was given to providing minimum impact to the privacy of neighbouring houses and premises, however where there are instances where a camera could potentially view an neighbouring property, in order to provide privacy protection for those affected Privacy Screens / Zones will be set up on the relevant cameras. These Privacy Screens are set by the system manager and involve 'drawing' a box around the area where there is concern to privacy, this box will then appear opaque on the system effectively screening the area from the system and its users. It is also worth pointing out that all operators and users of the system will have received training with regards to GDPR as well as for the CCTV system and will fully understand the impact of breach of privacy for neighbours with regards to system use.

10 CERTIFICATION

On completion of the system and handover to the client a Certificate of Compliance should be issued.

11 MAINTENANCE

Preventative and corrective maintenance should be provided in accordance with the requirements of NSI NCP 104.3. Preventative maintenance should consist of a minimum of 1 visit per annum.

12 EQUIPMENT SELECTION

All equipment used as part of the system to be non-proprietary, open protocol, commercially available equipment and not tied to any installation company.

Preferred new camera equipment would include Avigilon range of equipment.

Specification documents (pdf's) to be provided before installation along with samples (where requested).