

# CSU GUIDELINES FOR CONTRACTORS INSTALLING CCTV SYSTEMS

## Avigilon Software Version 6

**Updated – 07/01/2019**

Please check you have the most current version of this document via the below URL

<http://www.csu.edu.au/division/facilitiesm/tendering>

**Please note the following specifications detail equipment standards– final design must be authorised by the CSU CCTV Custodian.**

### SECTION 1

#### 1.1 OVERVIEW

This document details requirements for the installation and configuration of Closed Circuit Tele Vision (CCTV) products on-site at the Charles Sturt University (CSU). The implementations of the processes within this document are to be applied and tailored specifically to each installation to meet the needs of the University.

#### 1.2 SCOPE OF WORKS

This general specification will detail the performance requirements for the works that are to be carried out. This shall apply to the installation, supply or service of CCTV solutions to be delivered to the Charles Sturt University.

#### 1.3 PROJECT REVIEW PROCESS

In the best interest of both the CSU and the contractor it is a requirement that once final planning of scope and design of a CCTV solution has been defined it is submitted to the CSU CCTV Custodian. A final review of the proposed design and the day-to-day functional operation of the planned installation will be carried out.

## **SECTION 2        CCTV SYSTEM**

### **2.1        THE SYSTEM**

This specification calls for the supply, installation and commissioning of extension and modifications to the existing CSU CCTV system currently installed in various buildings and facilities operated by CSU. All sections of the CSU CCTV System are to be installed in accordance with appropriate local and international standards.

CSU Utilise the Avigilon Control Centre Network Video Management Software (Avigilon) for all new CCTV Hardware. Only the Avigilon System Shall be used. This is to provide seamless integration to the CSU monitoring Centre and complete cohesion of the security services university wide.

Where existing non-Avigilon systems are to be expanded, modified or replaced. Avigilon Cameras are to be installed. Any existing analogue cameras are to be migrated across to the Avigilon system at the point of failure.

The required and expected quality of images both viewed at the monitors, workstations and recorded needs to be such that;

1.        The image will be sharp, clear of image defects and digital artefacts/Pixelation.
2.        The images must not flare in bright light or be affected by light reflecting back into
3.        The images must not distort due to cabling or power related induction.
4.        The images must be stable, flicker and roll free.
5.        The images must be clearly in focus both day and night
6.        The images must not pixelate due to local Area Network infrastructure.

The cameras used for these works must be Avigilon and set up on site to;

1.        Suit the individual application and views.
2.        Suit the site conditions to ensure the best possible image is obtained.
3.        Minimise the possibility of theft or vandalism.

### **2.2        THE WORKS**

The works shall comprise a turnkey system design, installation, commissioning and training, with 12 Months Defects liability and preventative maintenance (in concert with manufacturer's recommendations) of the Avigilon CCTV system to support this functional brief.

The CCTV system is an IP Based Network Video Management System. The system is to be supplied with all equipment, hardware, software, licensing and ancillary services as required to provide a complete CCTV system and is to be functional in all respects. Network cabling is to be completed in conduction with the CSU Division of Information Technology (DIT) specifications. The Avigilon Software shall be upgraded to the latest version by the successful installer each time a new system is installed as required. All new equipment will be the latest version available at the time of placement of order.

The tenderers are to familiarise themselves with all matters related to the requirements of the CCTV systems and site and are to account for these requirements in the tendered price. Each item of equipment supplied shall be a standard product approved for installation in a CSU Site by the Campus Services Manager. Custom or non-approved hardware and/or custom operating firmware will not be acceptable for any part of the CCTV system.

Provide all plant, Labour & Materials to complete the works & co-ordinate & co-operate with all other trades associated with this trade work and staff operating within the facilities.

## **2.3 SERVER REQUIREMENTS**

CSU utilises a central server solution for the processing and storage of CCTV camera data. Projects requiring in excess of 15 Cameras must obtain permission to add the cameras to the existing server solution, allowing the CSU CCTV Custodian to ensure the additional load can be accepted onto the existing Server solution. Installers will be required to provide a channel license for each camera connection.

Some projects will require recording capabilities other than the central server solution, in these instances the CSU CCTV Custodian shall approve the server solution. At a minimum each High Definition Network Video Recorder (HDNVR) installed shall be supplied with a minimum of 3TB with Hot-Swappable Hard Drives all with a minimum RAID 5 data storage preinstalled and configured with a 2<sup>nd</sup> redundant power supply and Gigabit Ethernet connections.

## **2.4 APPROVED INSTALLERS**

The installation and commissioning of the Avigilon System is a specialised function, which should only be performed by companies and personnel who have an established record in this area. The Avigilon Software, HDNVR Hardware and related components shall be installed and commissioned by authorized integrators certified by the manufacturer. The CSU Campus Services Manager shall consider application from installers who submit a detailed schedule of experience and reference sites where similar or the same equipment has been installed. Evidence of certification by Avigilon is a requirement and must be submitted to the CSU Campus Services Manager as part of the tender / quotation response requirements.

## **2.5 SECURITY LICENSES**

The successful tenderer and their subcontractors must hold a current Master Licence under the Security Industry Act applicable to NSW. All operatives performing security related work under the control of the successful tenderer must hold a current licence under the appropriate Security Industry Act. All Contractors must have an ACA Cabling Licence and provide registration details. Evidence of a current Master Licence and individual Security Licences are a requirement and must be submitted to the CSU Campus Services Manager as part of the site induction requirements.

## **2.6 PROGRAMMING**

The Avigilon Software recording schedules, pre and post alarm recording options, motion detection, privacy zones, bandwidth limitations, camera names and locations, image quality and recording rates shall be individually programmed for each video source as directed by the CSU Campus Manager by the successful tenderer.

The Avigilon Software shall be programmed to display all video sources connected to the system. How the imagers are viewed including mapping the icons for each camera in the Graphical User Interface (GUI) and how they are displayed in alarm situations shall be programmed as directed by the CSU Campus Manager by the successful tenderer.

The Avigilon Software shall be programmed to authenticate users via windows authentication, before granting access to the system. Access rights for each user shall be defined individually for each user at the direction of the CSU Campus Manager by the successful tenderer.

Where required the Avigilon Software shall be programmed for Guard Tours, automatically switching between different predefined groups of cameras every few seconds (Dwell time) and automatically switching the inbuilt Virtual Matrix on specific actions or specific events such as camera analytics, Access Control Alarms and Violations via the Gallagher System.

## **2.7 SOFTWARE**

All software required for the works is to be supplied by the contractor and shall be in the name of the 'Charles Sturt University'. Each camera shall be provided with a license. Each workstation and server shall be provided with the required licences. The licence information is to be incorporated into the CSU 'as installed' documentation.

## **2.8 CCTV WORKSTATIONS**

Workstations are to be purchased through the CSU Computer Shop, ensuring a DIT approved solution is installed, in line with DIT requirements. Stick drive style mini PCs etc. will not be accepted and will not be able to access the DIT network. Please contact the CSU CCTV Custodian to organise this hardware.

## **2.9 NETWORK COMMUNICATIONS**

All network cabling shall be installed in compliance with CSU DIT cabling standard. The current standard can be found at the below URL.

<http://www.csu.edu.au/division/facilitiesm/tendering>

In addition to the CSU DIT cabling specification, all cabling shall be labelled at the start and end of the cable with a label of 'SECURITY CCTV'.

The successful contractor shall liaise with and take direction from the CSU Networks Infrastructure personnel based in each Campus.

CSU will make available switch ports for CCTV devices, the contractor shall allow for all other equipment required. Cameras will be powered by POE unless approved by the CSU CCTV Custodian. All CCTV equipment must be connected to the DIT network using patch leads coloured pink, this is to make identification obvious to all servicing staff. The contractor shall only use equipment approved by the CSU Networks Infrastructure personnel.

IP Addresses will be supplied for each item of equipment by the CSU DIT. Cameras are to be set to DHCP by the successful tenderer. MAC address registration will need to be completed by DIT, before any device will work on the network, please allow a minimum of 5 working days for this to be completed.

## **2.10 ALARM MANAGEMENT**

The Avigilon software alarm management shall keep an audit trail of all alarm and operators related operations in a separated database. Alarms shall be configured to display video content to the recipient users or monitors, including live and archived footage and maps. Where requested the Avigilon software shall be programmed to display multiple alarms, each with multiple videos, on any number of monitors, by the CSU Campus Manager. The user shall be able to snooze alarms, forward alarms to other users and acknowledge alarms. Alarms shall be configured to trigger recording of video and audio with pre-alarm and post-alarm periods, when defined. Alarm recording shall be marked with automatic bookmarks. Recorded alarm clips shall be searchable by searching for alarm history, recording reason or by bookmark text. The alarm management shall be able to set any monitor to automatically display cameras in response to alarm inputs and access events.

## **2.11 ACCESS TO STORED IMAGES**

Access to stored footage shall be programmed by the Contractor to ensure only authorised employees (i.e. not contract security guards) can remove recorded footage. Functions such as

Copying video to any medium, erasing any video or audit files, starting and stopping recording and altering video settings, must be password protected.

## **2.12 CAMERAS GENERALLY**

All cameras shall be provided with housing or may be a smoke dome or be an integrated system subject to specific needs. All camera housings must have anti-vandal characteristics and offer tamper protection features.

Cameras shall be positioned for ease of maintenance access and freedom from accidental damage by other trades. Cameras should be mounted at a minimum height of four (4) metres in public areas. Locations which are above drains or items of plant which preclude safe access shall be avoided. Cameras should not be located over drains, above desks or planter boxes or other obstacles hindering safe ladder placement. Where placement of cameras is above 2m hoist systems shall be used to access the cameras.

To reduce the risk against possible camera theft or tampering, all fixed cameras should be located within the field of view of another fixed camera where possible. Cameras should be positioned to avoid backlight and pointing into the sun at particular times of day, especially early morning and late afternoon.

Cameras must be positioned with respect to light fittings so that the lights are not within the cameras close-in field of view, thereby avoiding either glare in the camera scene or auto iris set back darkening of the targeted field of view. Cameras should not be directly behind light fittings where the light could cause camera glare or false iris (aperture) closure.

All camera mounts must be rigid particularly PTZ Cameras

Entry / Choke point cameras shall be mounted at a height and angle which allows front-on face views of people entering the area as opposed to side-on views or top of head views. This requires the horizontal and vertical angle of the camera with respect to the target object and direction of travel to be less than 15°. Generally the focal point and field of view shall be optimised to the location where persons passing through the entry / choke point are likely to look towards the camera. For people this is typically just after passing through a doorway, race, and lift or just after stepping off at the base of a stair.

All cameras shall provide the option to set each stream at variable bandwidth. All auxiliary outputs from the cameras shall be accessible over the Ethernet IP network. All new cameras shall provide a bidirectional audio in and out. Cameras shall be Avigilon HD Range cameras of Bullet, Dome or Pro variation only.

## **2.13 INTERNAL AND EXTERNAL FIXED CAMERAS**

These high definition professional IP cameras shall provide as clearly as possible, information about the general area such as accurate colour reproduction and clear images of the person to enable identification where possible of gender and other items of interest which authorities or management may use to assist in the identification of a person for what ever purpose is required. Coverage of the general scene will enable the operator to identify the goings on in a target area to provide adequate information regarding accidents / incidents and people absconding from the area etc. Where vehicles enter and leave numberplate recognition is required from all new cameras.

For identification at entry and exit doors to facilities, the entire target person should represent not less than 90% of the screen height, picture quality and detail should be sufficient to enable the identity of an individual to be established beyond reasonable doubt.

Where cameras are used for detection of persons e.g. car parks, corridors, waiting areas, computer labs etc, the figure should occupy at least 10% of the available screen height. After

an alert an observer would be able to search the display screens and ascertain with a high degree of certainty whether or not a person is present.

Where cameras are used to observe a person e.g. reception area a figure should occupy between 25% and 30% of the screen height. At this scale, some characteristic details of the individual, such as distinctive clothing, must be able to be seen, whilst the view remains sufficiently wide to allow some activity surrounding an incident to be monitored.

Where cameras are used to identify Number Plates, the licence plate characters should be not less than 5% of the monitor height.

General car park cameras shall maintain 12 ips at a minimum of 5 Mega pixel. Lift Lobby, fire stair, reception, and corridor cameras shall maintain 12 ips at a minimum of 2 Mega pixel. Foyer and external fixed entry and exit cameras shall maintain 12 ips at a minimum of 5 Mega pixel. Vehicle barrier entry cameras shall maintain 12 ips at a minimum of at 5 Mega pixel digital video resolutions

All internal fire stair cameras shall be vandal resistant dome cameras with an integrated IR illuminator with a 15 m range.

All internal main door entry area cameras shall view the door only and provide picture quality and detail with sufficient detail to enable the identity of an individual to be established beyond reasonable doubt.

## **2.14 EXTERNAL PTZ CAMERAS**

The pan tilt zoom (PTZ) system should give 100% coverage of the external ground floor surfaces of the buildings and vehicular entry points and be highly visible.

The cameras shall provide as clearly as possible information about the general area such as accurate colour reproduction and clear images of the person to enable identification where possible of gender and other items of interest which authorities or management may use to assist in the identification of a person for what ever purpose is required. Coverage of the general scene must enable the operator to identify the goings on in a target area to provide adequate information regarding accidents / incidents and people absconding from the area etc.

Any external PTZ cameras at the front, rear and side of the buildings must be integrated to the Gallagher ACIAS to allow camera presets to be driven from the use of the intercom system, access control readers, and door forced alarms, in ground induction loops for the vehicular gates, roller doors and external exit doors. If an external door falls in the field of view of a PTZ camera then that door shall be programmed as a pre set position for the PTZ camera. That preset position shall activate automatically in the event of an alarm or access violation. During normal non alarm periods the PTZ Cameras shall have tours and park positions programmed by the Contractor, at the direction of the CSU Campus Manager. The alarm outputs can be directly wired to the alarm inputs of the PTZ cameras or the High Level Interface (HLI) with the Gallagher System.

The internal PTZ cameras must be integrated to the ACIAS to allow camera presets to be driven from alarms and access events and violations.

## **2.15 CAMERA HOUSINGS**

All new cameras shall be provided with a housing or may be a smoke dome or box style housing subject to specific needs. All camera housings will have Anti Vandal properties and offer tamper protection features. Flexibility shall be provided in the housing to align the cameras in almost any viewing position to provide improved picture quality, reduce reflection and distortion, and provide the views required.

All external fixed Cameras shall be mounted at a minimum height of four (4) metres.

The pole mounted cameras will be supplied with purpose made pole mount adaptors. The pole mount adaptors shall consist of a light weight, rugged, one piece aluminium adaptors, designed to be mount on standard heavy duty wall mounts or dome to a pole mounts along with any accessories which may be required for a complete pole mounted system.

## **2.16 BIRD CONTROL**

All external camera housings and brackets will have wire spikes installed on top of the housings to discourage birds from sitting or nesting on the equipment. These measures may include mesh or spikes.

## **2.17 CAMERA POLES**

Submit a structural engineer's certificate for deflection and footing design on all camera poles. Poles should be not less than 4 metres high, measured at ground level. A foundation will need to be installed for the pole that will not allow the pole to distort or move laterally by more than 10 mm or rotate by more than 1 degree in a 25km/h wind.

The structural design of the pole must be engineered to cope with the effective sail area of all top mounted equipment.

Submit full shop drawings showing full mechanical details of both pole and footings. The tenderer should carry out compaction tests, as some of the sites may be fill and some areas are rock. The tenderers are to familiarise themselves with all matters related to such requirements and to account for such in the tendered price.

All cables shall enter the poles from the footing and not be externally visible. The poles shall have a tamper resistant cover plate to allow internal inspection of the pole located within 1 metre of the base.

If local power supplies are installed in the base of the poles from a 240vac supply an isolation switch or circuit breaker shall be installed.

## **2.18 CCTV UPS POWER SUPPLY**

An Uninterruptible Power Supply (UPS) will be supplied in the DIT rack by the Contractor. The UPS system will be sufficiently rated to power all equipment including CCTV Cameras, NVRs, Servers, Hubs, Switches, and the encoders and decoders and communications systems for thirty (30) minutes. The Contractor shall liaise with the site electrician. The UPS alarm outputs shall be monitored by the HDNVR's and Gallagher.

Where cameras are not POE (greater than 90 metres) they shall not be more than 150 metres from the supplied cameras. The minimum size of cables shall be 2.5 mm<sup>2</sup> (7/0.67) for 240 Volt circuits and 1.0 mm<sup>2</sup> (7/0.40) for ELV power circuits. Due consideration shall be paid to voltage drop when calculating cable sizes.

### **SECTION 3 AS INSTALLED DRAWINGS & OPERATING MANUAL**

On completion of the project, one (1) hard copy and one soft pdf. Copy of the following As Built documentation are to be supplied by the contractor.

As Built documentation is to be issued in a hardbound 4 ring white A4 folder clearly labelled.

#### **CCTV System As Built Documentation CSU Building xxxxx Security-In-Confidence**

The As Built documentation shall include the following sections clearly separated with dividers for easy reference;-

- Table of contents.
- Contractor details.
- 24 hour service contacts.
- Detailed Scope of works completed for the CCTV Systems.
- Bill of materials detailing product descriptions, part numbers, MAC address and quantities.
- Product information.
- Schematic diagrams in CAD format.
- Full set of 1:100 scale as built drawings in hard and soft copy formats. These drawings are to be in CAD format and clearly indicate all equipment locations, outlet numbers and cable routes.
- Test results including still picture images.
- Panel, Camera, Encoder, Hub and Switch, rack ect, Layouts.
- System Description.
- Equipment Description.
- Copy of customer training material.

The successful tenderer should note that provision of documentation constitutes part of the Commissioning process. Therefore, practical completion is dependent upon this requirement.

### **SECTION 4 MAINTENANCE**

#### **4.1 GENERAL**

Provide twelve (12) months operational maintenance commencing from the date of final acceptance of the commissioning tests for the CCTV, systems. The site will be deemed to be operational once testing, training and recording begin.

One (1) periodic maintenance visit is required during the first 6 months and second visit one month before the end of the DLP period.

During the visit the Contractor shall complete the tests nominated.

- All system access and maintenance checks are to be undertaken using an admin login.
- Check all 240 volt supplies feeding the system.
- Check all communications equipment.
- Check wiring and conduits for tampering and damage.
- On completion of periodic maintenance enter details of work performed.
- Carry out short training refresher sessions.

The maintenance of the CCTV System should include cleaning of all camera housings, dome covers, workstation screens etc, inspections for loosened or corroded brackets, fixings, connections etc and reprogramming of some functions of the Avigilon system as required by the CSU Campus Manager. Retraining of the system operator(s) as required and taking still shot recordings of all cameras for comparison to installed still shots recorded to check for



movement of viewing scene or angle of view and or deterioration of image. The maintenance shall include taking images for archive purposes. Images are to be taken from both night and day time recordings.

Visits are to be carried out during normal office hours and in the presence of the nominated Authorised Person.

Appropriately qualified and licensed persons should conduct this maintenance.

## **SECTION 5 TRAINING**

The Contractor shall provide a structured training and familiarisation program on the CCTV System for nominated staff. The Contractor shall make provision for two (2) separate sessions, each being minimum one (1) hours duration.

## **SECTION 6 TESTING AND COMMISSIONING**

The contractor shall supply commissioning and preliminary test figures not less than seven (7) days before final witness / performance tests are scheduled to commence. Once the contractor has tested the complete system, documented the testing carried out and the client has been trained, final witness / performance testing can commence.

Full commissioning checks must be undertaken by the successful tenderer prior to witness testing and final Performance testing. All faults must be rectified at this time. Final commissioning actions and results must be fully documented. Results must form part of the As-Installed documentation.

A 14 day fault free period must be achieved after practical completion of the works. CSU shall issue a certificate of practical completion following the final test and evaluation of the as installed manuals.

All works and services provided under this contract as a minimum must be in full compliance with the appropriate Australian Standard relevant to the works and services being carried out and provided by the contractor.

## **SECTION 7 DOCUMENT CONTROL**

<b>Doc. Version Number</b>	<b>Date</b>	<b>Short description of amendment/s</b>	<b>Change Made By</b>	<b>Change Authorised By</b>	<b>To Match Software</b>
3	17/01/2011	Amendments to 1.8, 1.9 & 1.24	Terry O'Meara	Terry O'Meara	Version 3
4	01/06/2017	Amendments to comply with Version 5 Avigilon software	Terry O'Meara	Terry O'Meara	Version 5
6.0	07/01/2019	Document update, version numbering, name change and removal of contract terms and conditions to align with CSU website deployment.	Tim Harris	Terry O'Meara	Version 6