GUIDE TO SPECIFYING A CCTV SYSTEM

Introduction

This paper is aimed at the end user and is guidance on avoiding some of the pitfalls created by a poorly structured or ill thought-out specification.

You should be aware of the distinction of the cheapest tender or the best value for money. This is where an effective specification can assist in making the correct selection from competitive tendering.

There are many products where the buyer is knowledgeable in the requirements and can identify the precise product. Such as, buying machine tools where the specification is precise as to the performance against specific needs. Or buying computers where an IT manager knows the exact needs of each department. Security systems, however, are frequently a one off purchase with no previous experience on the part of the buyer. For this reason they are vulnerable to pressure from inexperienced salespersons offering the wrong solution based on their company's' particular products. For instance, selling CCTV when an intruder alarm, access control or better physical security is a more effective answer. Or a salesman specifying a piece of equipment manufactured by his own company or tied to a supplier agreement where only a handful of pieces of equipment must be sold to meet quotas.

Do you really need CCTV?

Closed Circuit Television is not the panacea to all security and safety problems that many people believe it to be. CCTV should only be part of an integrated approach that considers all aspects of the security problems being experienced. Including the training of staff and the management of the system after installation.

Set out your needs

There must be a starting point for preparing a specification so that it will reflect the reason for producing it. Make a statement of the problems that are to be resolved, such as:

- Vandalism in Town Centres.
- Shop theft.
- Industrial or commercial break-ins.
- The target for the intruder, is it material goods or information? I.e. industrial espionage.
- Danger to individuals from attack.
- Health and safety of individuals on the premises or site.
- To replace or reduce manned guarding.
- To supplement manned guarding, making them more efficient.
- To monitor persons entering and leaving the premises.
- To provide visual confirmation of intruders activating an alarm.
- To monitor a remote, unattended site.

The list is obviously endless in general terms, but for a particular site, there must be finite reasons for considering CCTV. If they cannot be listed, you probably don't need it.

Set out possible solutions

Having set out the problem to be resolved, the next consideration is how a solution can be achieved. Some of the possibilities are:
• Better lighting, in itself a strong deterrent.
• Better fencing and gates around the perimeter.
• An intruder alarm.
• An access control system.
• Perimeter protection by fencing movement detection.
• Perimeter protection by buried detectors.
• Improving physical security, better locks and doors, etc.
• CCTV
• Passive infrared beams.
• Active infrared beams.
• Access control, barriers.
• Manned guarding.

Again, the list will depend on the circumstances and requirements on any particular site, but it is important to at least make a list and consider all the possibilities.

List pros and cons for each possible solution

Many of the items in the list will be impracticable and so you should finish up with a short list of possibilities. The next thing is to comment against each one the pros and cons. Quite often, the solution will point to a need for integrating two or more types of system. This Magazine and article are directed at CCTV solutions, therefore it will be assumed that after all considerations, it has been decided to pursue this avenue.

So, OK, you have decided you need a CCTV system

Now you can get down to specifying the system.
This raises several more considerations to be resolved. Two of the most important are where and how will the system be monitored. Quite often, how the system will be monitored, will dictate where it is to be monitored. So, another list of possibilities to be considered.
Set down what you expect the system to achieve. This can be a simple statement describing the aims of the system and will help in designing the layout.

Set down a list of objectives for the system

The overall objective could be the statement describing the aim of the system. Then there are other objectives, for instance, for a Town Centre system they could be:

- To provide a deterrent to crime and vandalism.
- To enable 24 hour monitoring of all the designated areas, recording for a month.
- To enable clear identification of miscreants within the range of the cameras.
- To provide continuous recording of all cameras in the system.
- To provide recordings only when someone moves in front of a camera, therefore making playback simpler to watch and recordings last longer.
- To enable rapid movement of any camera to pre-set positions of pan, tilt and zoom.
- To provide independent viewing of any camera at the police station.
- To enable live, real time recording of selected cameras.
- To enable a warning to be given to burglars who enter the site.
- To enable the police to be called immediately when an intruder is on your site, therefore preventing theft or vandalism before it happens.

Another example for commercial premises could be:

Main objectives:

- To detect intruders around the perimeter of the main building and alert the security guards. To provide a permanent record of activity from all cameras.

Supplementary objectives:

- To provide security at the substation and oil tanks.
- To provide identification of vehicles and persons at the barrier or gates.
- To identify callers using the intercom at the main entrance.
- To provide security for the directors car parking area.
- To monitor persons using the entrance doors to the computer areas.
- To alert security if a fire exit is opened and display the relevant camera.
- To provide general surveillance of the site without compromising overall
- security.

This would form the basis of the system design and in measuring performance when the installation is complete.

Who will design the basic system layout?

There are two possibilities; the first is that the end user knows exactly where all the cameras are to be fitted and the location and operation of the control room. This is quite common in Town Centre systems where the Local Authority, Police, and other parties have determined the areas for surveillance and operation of the system. In these cases, the next step is to prepare the specification.
The second possibility is that the end user knows the problems to be tackled but does not have a clue how a solution can be achieved. The common approach to this is to describe the problems to several installation companies and obtain quotations. The problem with this is that the customer will not have the knowledge to make an objective assessment of the several different solutions and costs submitted. The answer here would to employ the services of a competent consultant, like Bartec Fire & Security, who can
specify the system for you, who can provide a full design and consultancy service including CAD design.
For the purposes of this paper, it is assumed that the customer is intending to prepare the specification and knows the camera and control locations.

The types of specification

The form of the specification will depend on the technical knowledge of the person producing it. This is an area where a little knowledge can be very dangerous and costly. The concept of the specification should be that is easy for tendering companies to understand exactly what they are expected to price for without wading through reams of documents. The more difficult it is to comprehend a specification, the greater will be the variation in tender prices. The first thing is to produce a general description of the system. It needs to be succinct and could be along the following lines:

The system will consist of four fully functional colour/monochrome cameras at specified locations. The cameras will be fitted in discrete domes and be capable of being directed to eight pre-set positions of pan, tilt, and zoom. These will be connected back to a control room at the Police Station. The controls will consist of a digital hard disk recorder “DVR” or network video recorder “NVR” and keyboard telemetry controller. The system will be monitored on one 19" and three 17" colour monitors. There will be a real time DVR for recording events from the 17" monitor.
This can be followed by a description of how the system will be operated. The next item would be a list of camera locations and how they are to be mounted.
Part of the specification will be to produce a list of equipment specifications, which allows for two options. The first is to specify every item by manufacturer and model number. The advantage of this is that a totally objective comparison of all tenders can be made. The disadvantage is that there are many makes of camera, for instance, that have identical performance characteristics. By specifying one model you would give advantage to the tendering company that has the best buying terms with that manufacturer. There could be far better terms available for alternative makes with a consequent reduction in tender prices. Another disadvantage is that there could be better products on the market of which you are unaware and thus eliminating from consideration.
The answer to this is to produce a performance-related specification where the generic description of a product is given. It does mean that when assessing tenders, the specification of the variations must be checked. Generally, a performance specification will ensure the most competitive prices may be obtained.
Again this is where the services on an independent security consultant from Bartec could save much time and money.

The elements of the specification

A typical specification may be broken down into the following headings. Suggestions are given for some specific items where these may be overlooked as being part of the CCTV specification. Most companies and Local Authorities produce impressive and sometimes massive terms of contract conditions. Even though it may mean some repetition, there are certain conditions specific to CCTV specifications that should form part of the CCTV document. The objective is not having some well hidden clause that forms legal protection for the customer, rather, to prevent that clause being needed at all.

Operational and equipment specifications

1. Responsible authority:
2. Introduction
The following are the main objectives of the system:

List the system objectives to convey to the tenderer what you want to achieve.

1. List of drawings included with specification

2. Performance specification (example)

The specification is given as a performance related specification for the system and equipment. It is the responsibility of the Companies tendering to select the most appropriate equipment to fulfil the objectives and requirements of the system. (Certain items may be specified by manufacturer and model number where they have a bearing on system performance specific to this project.) Part of the tender evaluation process will to assess the quality, reliability, and suitability of the equipment proposed. The Authority will not be bound to accept the lowest or any tender.

3. Future expansion

State whether the system is likely to be extended in the future and the possible extent of this.

4. Systems to be installed or connected

Indicate whether there other systems that will be or possibly be connected to this System

5. Operation of system

Where the system will be operated from and who will operate it.

6. Camera locations

Serial No.	Location	Mounting
1		
2		
3		

7. Transmission of video and telemetry

8. Equipment specifications

1. Cameras
2. Lenses
3. Distribution amplifiers
4. Monitors
5. Camera housings
6. Pan, tilt units
7. Equipment finish
8. Hard Disk Recorders, Network Video Recorders
9. Media
10. Matrix switcher
11. Telemetry receivers
12. Keyboards and controls
13. Console
14. Monitor wall
15. Matrix switcher general description
16. Cabling
17. Server Software and Client Software
10. Equipment summary

The following equipment lists are to summarise the main content of the systems and are not intended to be exhaustive. The contractor is responsible for ensuring that a complete working system is provided.

9. Provisions by customer

List any provisions that you will provide, such as storage facilities, power supplies, free issue equipment, etc.

10. Installation

1. Timing
2. The likely time scale for placing a contract and the time for completion.

11. Co-ordination

State whether there is co-ordination required with other contractors, for instance, fibre optic cable installation.

12. In-house manufactured equipment (example)

All equipment, consoles, telemetry, switching and recording, etc. must be proprietary, generally available products. This is to ensure that the future extensions to the system may be carried out by any installing Company extending the controls by adding cards, cages, etc. The use of specialised in-house manufactured components will not be acceptable. This does not preclude the use of 'badged' products, providing the manufacturers are clearly stated and the product has not been modified or customised in any way.

13. Sub-contracting (example)

No part of the contract may be sub-contracted to any other company or individuals without the express written permission of the Customer. Unless specified to the contrary, it is assumed that all work will carried out by the contractor’s direct labour. If it is intended to sub-contract any part of the design or installation, this must be made clear in the tender submission and the name of the sub-contractor(s) must be provided. The Customer reserves the right to accept or reject nominated subcontractors.

14. Access equipment (example)

The contractor will be responsible for providing all access equipment necessary to enable safe installation of all high level equipment and cabling.

15. Health and Safety on site: (example)

The Contractor will be expected to comply with all health and safety requirements issued by The customer. It is the Contractors' responsibility to provide all access equipment required to complete the installation in accordance with good safety practices

16. Compliance with regulations: (example)

The installation will comply with all relevant regulations, the requirements of BS 7671 1992 (17th Edition) Wiring Regulations for Electrical Installations as issued by the Institute of Electrical Engineers) "The Requirements for Electrical Installations". It will also comply NSI standards for planning, installation and maintenance of Closed Circuit Television Systems".
Where mains wiring is included in the contract, this must be installed by an suitably qualified electrician and the necessary “Minor Works Certificate” provided.

17. COMPLIANCE with specification (example)

All tenderers must include a statement that the system proposed and priced complies with this specification. Variations and suggestions for changing or improving the system should be listed and priced separately.

18. Indemnity and insurance (example)

The Contractor shall indemnify and keep indemnified the Customer against the injury to, or death of, any person, and loss of, or damage to, any property arising out of or in consequence of the Contractors obligations under the contract and against all actions, claims, demands, proceedings, damages, costs, charges and expenses in respect thereof. For all claims against which the Contractor is required to insure, the insurance cover shall be a minimum of £1 million or such greater sum as the Contractor may choose in respect of any one incident.
The Contractor will be expected to produce evidence of sufficient insurance cover to meet these requirements before any work is carried on site.

19. Modifications and variations (example)

No modifications or variations to the contract will be permitted without the written consent of the …….. Manager.
The Contractor shall notify the supervising Consultant immediately if any unforeseen circumstances are encountered during the course of the Contract which may require modifications or variation and shall await instructions before proceeding with any part of the Contract which may be affected.

20. Pre-assembly and testing (example)

All equipment is to be pre-built and tested at the contractor's premises before being delivered to site. The telemetry controls, control of multiplexers and central time/date generation to VCRs is to be assembled and proved to the satisfaction of the client's representative before being delivered to site.

21. Testing and commissioning

22. Practical completion (example)
When the contract is considered to be complete, Practical Completion will be effective after fourteen consecutive days of uninterrupted, fault free operation.

23. Warranty period (example)

The Contractor will repair, correct, or replace any defect of any nature that may occur for a period of twelve months from the date of the issue of the Certificate of Practical Completion. To this end, the Contractor will attend site within xx hours/days of the fault being reported. The defect will be corrected without undue delay. To this end, the contractor will hold sufficient stock of spares to allow speedy repair or replacement of equipment. Waiting for manufacturers to replace or repair equipment will not be acceptable.
The Contractor will provide the employer with details of telephone and fax facilities for reporting such defects. *The warranty is to include for full maintenance of video recorders in accordance with the manufacturer's' recommendations.*
The contractor will have in operation a system whereby all service visits are recorded on a multi-part form, a copy of which will be left on site. The form will record the date and time of the fault being reported, the nature of the reported fault, the date and time of the visit and the actual fault together with the remedial work carried out.

24. Maintenance (example)

The contractor is to submit a full schedule of maintenance to be carried out on the system during the warranty period and under subsequent maintenance contracts.

25. Operating instructions (example)

On completion of the contract, and before the issue of a Certificate of Compliance, the Contractor will provide a full set of manuals and operating instructions. This to include comprehensive descriptive brochures and technical manuals for all equipment forming part of the contract. It should include as-fitted wiring and schematic diagrams.

An A4 laminated sheet is to be provided with short form operating instructions on one side, and a site diagram showing camera locations and pre-set positions on the other.

26. Training
Specify what training will be required and over what period.

27. Submissions required with tender

28. Summary of tender prices required

29. Options to be priced separately

Hopefully, this has produced a checklist that will be useful when preparing a tender document for a CCTV system. The final question is how do you decide which companies to invite to tender?

Tip: ask for referrals and testimonials, ensure that the tenderer provides examples of systems over 2 years old, with examples of service and call out charges as it's common to tender a low installation price as a vehicle to expensive service and call out costs after the installation warranty has expired.