

The possible resources and their effectiveness.

1.1 Introduction

The determined intruder will eventually find a way to penetrate any physical protection measures. However, the greater the number of layers of protection, the more difficult it will be for the intruder. Ultimately, the aim should be to find a cost-effective balance of measures which will be sufficient to deter the intruder, or slow him down for long enough to enable the security forces to detect and catch him before he can cause damage to the business.

1.2 Principles

The 6 Ds of Perimeter Security are:

- Demarcation - Define the perimeter to prevent accidental Access and mark the boundary of the facility.
- Deterrence - Try to persuade the intruder to attack an easier target elsewhere.
- Delay - Try to slow the intruder down and make him proceed with caution.
- Detect - Have systems and/or personnel who can see or hear intruders.
- Discriminate - Make sure that you can tell the difference between legitimate people, wildlife, false alarms and intruders
- Detention - If an intruder gains access you need to detain him quickly before he can cause any damage.

1.3 Perimeter Systems

a. Fences/Walls

Fences and walls are the simplest form of marking a perimeter or boundary. They include the following, in increasing order of effectiveness and cost:

- Chainlink Provides a barrier, but can easily be cut or scaled. Can be improved if fitted with razor wire/tape, detectors or electrified systems. Vulnerable to climate. Cheap.
- Weldmesh/
Expanded Metal More difficult to cut, especially if a double layer is used. 2 x cost of chainlink. Tough and durable.
- Steel Palisade More difficult to breach. Very durable. 5 x cost of chainlink. Little maintenance required.

- **Brick/Stone Walls** Prevent outsiders from observing activities on site but also prevents view of outside activities. Protects against rockets, small arms and blast. Cost and effectiveness depend on material used, but usually most expensive option. Can be breached if only brick.
- **Steel Plate** Also prevents outsiders from observing activities on site.
7 x cost of chainlink.
Most difficult to breach

Fences and walls should not be less than 2,50m high overall, which may include a topping of barbed or razor wire. Double fences may be necessary on high-risk sites.

The weakest points on perimeters are gates, especially unmanned gates. Strict control of entry is needed on gates in use, and surveillance on emergency and closed gates is essential. Gates should be of an equivalent security standard to the fence or wall. Hinges should be designed to resist removal of the gate. Ground clearance should not exceed 50 mm.

b. Gatehouse

Although much will depend on site layout a gatehouse will normally form an integral part of the perimeter and be the primary control point for all access to the site. The gatehouse should not be the primary control centre for overall security duties on the site.

Depending on the type and volume of traffic expected one or two gates may be incorporated. The gatehouse building may bridge the gate area or stand back from the fence line with a vehicle inspection area in front.

While not designed as a fortress the gatehouse must be a substantial building capable of withstanding the accidental or deliberate impact of vehicles. Provision should be made for a visitors waiting room, search room, toilets and staff rest room. Staff, whether or not employed at the gatehouse, should be discouraged from congregating in the vicinity of the building and gate areas. If patrols operate from the gatehouse staff should be confined to rooms provided whilst between patrols.

The following minimum basic resources are required:

- Vehicle movement register;
- Staff movement register;
- Visitor register;
- Occurrence book;

- Plan of site;
- Stand-by portable lighting (torches etc.);
- First aid box;
- Telephone(s)/radios;
- Back-up control panel for lighting, fire and intruder alarms;
- Routine and emergency orders.

The level of staffing and their duties will depend on known or anticipated volume of movements. Assuming a steady flow of traffic in and out with peaks at commencement and end of shifts a staff level of three will normally be the absolute minimum - one to control movements inward, one for movements outward and one to oversee and co-ordinate the overall duties.

c. Lighting

Lighting is one of the most cost-effective systems available for low-light/darkness use. However, expert advice is needed to obtain the maximum benefit from lighting. **Lux** is the measurement of light (100,000 lux is tropical sunshine; 1,000 lux is poor daylight; 3-5 lux is the average street lighting, which can deter intruders). 60 lux is needed for vulnerable areas.

All lighting intensity needs to be checked by meters. Types of lighting are:

- Perimeter To illuminate the whole perimeter to help demarcate, deter, delay, detect and discriminate. Usually elevated.
- Area To illuminate operating areas and parking areas, to help deter, delay, detect, discriminate and detain. Concrete reflects, tarmac does not.
- Floodlighting To illuminate vulnerable points to help detect, discriminate and detain.
- Glare Illuminates outwards to make surveillance difficult. Helps to deter, delay, detect and discriminate. Usually on the ground

Lighting should cover the whole area, with no dark spots, and be combined with surveillance. It should help conceal security forces. It should not cause a hazard or a nuisance. High efficiency lights should be used, and patrols should report the need to replace unserviceable lights promptly.

d. Closed-Circuit Television (CCTV)

CCTV systems are a very effective surveillance system so long as they are monitored continuously. Their success in providing evidence to convict criminals is proving a significant deterrent.

A good CCTV system should include the following:

- Charge-coupled rather than tube-type cameras.
- Good performance in low light/infra-red light out to the distance required.
- Color rather than black and white monitors.
- Good quality videotape recorders.
- Regular changing of tapes, to retain good quality pictures. DVD registration provides better quality.
- An annual audit.

e. Perimeter Intruder Detector (PID) Systems

There are several different types of PID, as follows:

- Power Fence Pulsed electrical system with alarm. Inexpensive. Very reliable.
- Seismic Sensors in the ground to detect vibration. Expensive.
- Acoustic To detect sound. Microphones, cables. Effective, reasonable price
- Visible Video motion detectors. Expensive, problematic
- Microwave Breaking the beam triggers an alarm. Need sterile environment. Unreliable
- Electro magnetic Cables detect variations in magnetic fields. Problematic
- Thermal Infra Red Passive IR. Wide range of uses. Cheap. Effective.
- Near Infra Red Active IR. Photocells. Expensive. Effective

Important considerations are:

- Decide what needs to be detected.
- What actions will be taken when someone is detected?
- What local conditions (e.g. weather, ground, water) will affect the system?
- What alarm system will the PIDs be connected to?
- Who will monitor the alarm systems?
- The system must have a low false alarm rate (FAR), typically a maximum of less than 1 FAR per kilometer per day.

N.B. No single system offers a guarantee of detection.

f. Personnel.

Often the most cost-effective intruder detection system is personnel, both guards and personnel on site, who can quickly spot strangers. Personnel have the advantage over other systems of being flexible and able to change task. They are also able to exercise judgment and discretion, and react quickly to incidents. However, they can only work for limited periods of time, they can become bored by repetitious work and they may not be suitable if not properly trained for their duties.

Physical protection systems cannot completely replace guards. However, they can be used to perform routine security tasks on a 24-hour basis, thus enabling guards to be used more effectively to provide patrols to deter and detect intruders, and reaction forces to detain them.

g. Dogs

Despite the relative ease with which dogs can be overpowered they are still the most feared element in any layered intruder detection system. They are a powerful deterrent, their acute senses can detect intruders and their ability to detain intruders is formidable.

1.4 Summary.

In summary, it is important to remember that none of the above systems are likely to be completely effective on their own. An integrated approach is needed, using a combination of the most suitable and cost-effective system to suit local threats and conditions.