Harris Crime Prevention Services

Independent Security
Risk Management and
Crime Prevention Consultants

PO Box 1550
Macquarie Centre
North Ryde NSW 2113

Telephone 1300 888 878
Facsimile (02) 9804 8775
E.mail : lharris@harris.com.au
www.harrisceimeprevention.com.au

17 March 2009

Mr Tim Campbell
Development Manager
Defined Developments
Suite 302, 35 Lime Street,
King Street Wharf
SYDNEY NSW 2000

Dear Tim,

Security Consulting Services
Top Ryde Shopping Centre Redevelopment (Commercial) Buildings A & B

We have pleasure in submitting this Final Report for your reference. Should you have any questions please do not hesitate to contact me.

Yours sincerely,

Leon L. Harris Dip.Sec.Studs.,CPP
Principal Consultant

Security Design Report
for
Development Application

Top Ryde Shopping Centre Redevelopment
(Commercial) Buildings A & B
2 Devlin Street, Top Ryde

on behalf of

Defined Developments

March, 2009

S e c u r i t y - I n - C o n f i d e n c e

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1 THE PROPOSED REDEVELOPMENT:
A 'welcoming and safe environment'

The proposal seeks to construct two commercial buildings – Building A and Building B. Both buildings form part of the Top Ryde mixed use redevelopment incorporating residential, commercial, retail and recreational occupancy. Master planning and design documentation for the approved retail complex has emphasised 'welcoming and safe environment' experiences.

The 'welcoming and safe environment' emphasis is critical to the total redevelopment's viability and reputation. The client's aim is to continue this emphasis within the commercial building precinct, such that occupants and visitors are re-assured that issues of personal safety and property security are reflected in all (relevant) aspects of the design.

In terms of this proposal, a 'welcoming and safe (work) environment' may be defined as: '*an environment where security has been considered as part of the master-planning, design and construction processes and where the security outcome enhances the proposal's reputation*'.

The intent is to ensure a seamlessness of security design within each of the individual developments that comprise the site's vision. The commercial precinct's security architecture and systems should therefore complement the security design of all other precincts. This ensures overall security integrity which positions the redevelopment to enjoy a positive security reputation, whereby users of the different spatial 'zones' can move to and from each, confident of integrated and effective protection. Our 2006 report stressed the importance holistic security integrity. The (security) design philosophy of that report extends to this proposal.

We define 'security design' as: '*an environmental crime prevention strategy, applying aspects of architecture, engineering and technology to all urban development proposals*'

2 SCOPE OF THE REVIEW

The scope required a review of the drawings to be submitted for development approval. The review is underpinned by the following objectives:

2.1 Design Specifics: affirm design features of the proposal, supporting legislative and/or planning compliance requirements and identify possible modifications and/or security design changes to drawings that may better reflect compliance or that may strengthen the client's 'welcoming and safe environment' aim.

In the case of this proposal, all security design specifics should:

- meet State and/or local government crime prevention regulations and/or guidelines
- complement relevant aspects of architectural and engineering goals
- complement the security design strategies for the whole site
- be unobtrusive and minimalist in impact
- respond to owner/occupier security requirements
- be cost-effective
- be integrated with post-construction security procedures and management
- set a (security) standard in line with community and client expectations.

2.2 Security Design Compliance: ensure that the design specifics referred to in 2.1 above, comply with the security (crime prevention) requirements of Council and with the requirements of Section 79C of the Environmental Planning and Assessment (EPA) Act.

2.3 Local Crime Risks: assess the local environment in terms of crime risks or trends and their likely impact on the commercial goals of the development's stakeholders;

3 THE STAKEHOLDERS

The client-stakeholder base includes:

- the developers
- owner and/or occupiers of the commercial buildings
- owner-operators of the entire redevelopment
- the Council and State authorities
- persons accessing the commercial or other zones within the redevelopment.

4 DESIGN SPECIFICS - THE ISSUES

Pursuant to providing a welcoming and safe work environment, the following areas have been reviewed:

- building perimeters
- pedestrian access to offices from street and retail levels
- vehicle access to Level 3 and Level 4 and car park layout
- access to offices from car parks
- lift foyers and lift or stairwell access to commercial levels
- coordinated signage
- protection of utilities infrastructure
- storage and disposal of commercially sensitive documents
- storage and disposal of waste

4.1 Building Perimeters

Building perimeter exposure is to the west (Devlin Street) and to the south (Blaxland Street). Vehicle and pedestrian access to Buildings A and B is via Devlin Street, including the public link to the site from the proposed connecting over-bridge.

The exposure to all upper level building perimeters (Levels 3 to 8) is restricted. However, street-level exposure exists in relation to pedestrian and vehicle access points.

Our July 2006 report highlighted the importance of designing and/or treating street-level facades to prevent graffiti or other criminal intent around the site's entire perimeter The utilisation of toughened glass, vandal resistant materials and strategic lighting design, were recommended to reduce probability of damage or defacement.

These recommendations are relevant to the perimeter definitions of the two entry approaches to Building A – essentially a set-back entrance on the corner of Blaxland and Devlin Streets and Building B – part way along Devlin Street to the north.

There will be some retail-oriented pedestrian activity along Devlin Street, however access to the retail complex is essentially along a north-south axis from Blaxland and Pope Streets. While there is an intended disconnect between retail-oriented activity and activity focussed on the commercial space, any legitimate movement through the arcades to and from Devlin Street will

add to 'eyes and ears' surveillance of the entire Devlin Street perimeter. The design of the connecting over-bridges should also permit increased levels of surveillance.

The vehicle and pedestrian entry points are the connectors between the commercial blocks and street-level retail/commerce. It is therefore important to ensure that the western and northern perimeters are afforded appropriate security design attention to protect from casual or intended criminal malice, given the prominent street-frontage exposure; hence our recommendations regarding lighting and façade treatment.

We would recommend that the streetscape of the Blaxland and Devlin Street set-back be designed to maximise perimeter and street-corner surveillance, ensuring that paving, lighting and landscaping discourage opportunity for loitering or concealment.

4.2 Pedestrian Access to Offices from Street and Retail Levels

The two Devlin Street pedestrian entry foyers are clearly defined in terms of purposeful access to information boards and lifts. We note adjacent restricted and/or emergency access and egress points to the north of each and we note that there will be limited pedestrian access from the Devlin Street bridges.

The security design treatment of street level glass doors and glass entry facades should follow our earlier recommendations for the entire perimeter. Sight lines to and from the street provide adequate opportunity for day time surveillance. Night time sight lines will be enhanced by appropriately designed internal and external overhead (down) lighting, the aim of which is to provide scaled lumen levels for staff exiting into relative darkness.

There is sufficient set-back to obviate the need for splayed treatment of main entry or (restricted) access/egress doorways. However, the bridge access/egress to street level is recessed and we would recommend that angle-beamed down lighting be installed in the underside of the bridge to increase the overall illumination of the Building A entry precinct.

CCTV might be considered for the Devlin Street entry precincts, particularly in at the Building A entry precinct.

Should the installation of CCTV be considered for both entry foyers, we would recommend that these installations be integrated with a whole-of site security management monitoring operation.

4.3 Vehicle Access to Level 3 and 4 and Car Park Layout

We understand that vehicle access to the Level 3 and 4 car parks will be controlled by key or proximity access card. CCTV monitoring of the vehicle entry to both levels is recommended as part of the overall technical surveillance of the entire site. Surveillance is especially critical for vehicles accessing the more remote bays after hours.

The car park layout provides good sight lines to the various spaces, including disabled bays, thereby maximising opportunities for passive and technical surveillance. The layout is free of kiosks or other enclosed spaces whose design could provide opportunities for concealment or entrapment.

We recommend higher lux level lighting over car parking bays and in the vicinity of, and at, lift foyers. Appropriate signage is required, even though those accessing the car parks will be familiar with their layout.

We also again make the point about car park support columns. Notwithstanding the structural implications, from a security perspective, it is advisable to avoid square or rectangular supports

in favour of round or elliptical columns. Assuming this reduces overall structural integrity, we recommend round or elliptical column facades be installed where concealment could occur.

4.4 Access to Offices from Car Parks

The location of both lift foyers facilitates good surveillance on each of the car park levels. Both foyers provide good sight lines into the Level 4 corridors. However, the southern foyer on Level 3 is isolated and may require additional CCTV or lighting treatment. Additional lighting at the car park foyers aid clear visual recognition of persons entering or alighting from lifts.

4.5 Lifts, Stairs and Stairwells

Lifts and levels to both Buildings will be accessed by office personnel, visiting clients, technical and cleaning contractors. While it will be expected all nominated authorised users will have programmed proximity cards to control access to floors, their personal safety and security is greatly enhanced if all lifts are fitted with toughened glass panels.

Note: The matter of two way lift-related observation has been an issue in many contexts for a number of years particularly in transport, retail and mixed use complexes. In these contexts, developers are increasingly opting for (a) an observation panel in lift doors or (b) fully transparent lift doors or (c) lifts and lift foyers constructed of glass and/or (d) the installation of CCTV cameras within lift carriages. Our preferred recommendation is option (a) which would complement the recommendation regarding CCTV surveillance in lifts and foyers.

We recognise that there are cost implications and we also recognise that there may be legislative and or other compliance implications which may prevent this recommendation from being adopted.

The ordinary use of fire stairs may be an option for those wishing to enter or exit from the car parks and the lower office levels. Because of fire restrictions, stair well doors cannot be fitted with glass panels. For this reason consideration should be given to CCTV monitoring of these access points within both car parks. Also, a security risk does exist should a ground floor emergency exit door be accidentally (or intentionally) left ajar by persons exiting thereby providing unauthorised access to fire stairs and individual office block levels. For whole-of site consistency, we recommend that, in consultation with an accredited BCA consultant, the street exit emergency doors be electronically locked with appropriate emergency egress capabilities. Warning signage should be displayed on exit doors.

4.6 Coordinated Signage

A coordinated signage strategy is recommended for both office complexes, as part of a coordinated strategy for the whole site. Our report (2006) in relation to the Shopping Centre complex outlined the rationale for a coordinated approach that is applicable to this development:

"*Signage normally is a mix of:*

- *signs – displaying visual and/or audio text information*
- *symbols – displaying illustrated representations of text information*
- *notices – displaying warnings or messages using signs or symbols*

Good (strong) external and internal signage as a communication medium will signal safety and way-finding certainty as well as assisting in access control. All occupiers/users and contractors will be reassured by signage that provides security clarity, a guide to directions and a security design measure. Signage is also appropriate for emergency assembly points.

We recommend that a (model) colour-coordinated signage brief be developed, utilising text/symbol styles, linking all signage to lighting points for ease of night time identification, similar to the compulsory "exit" signs. This should include reflective signage and/or illuminated signage, either powered or located directly under the beam of internal or external light sources. Signage should be expressed in positive terms particularly where signage aims to guide and direct.

The use of warning signs is a security feature in that such signs set limits and restrict access. Warning signs, therefore, have a security and safety function. They inform of hazards or restrictions of access, they warn of consequences including penalties for breaching access restrictions. All warning signs should give some reason for encouraging compliance, e.g. premises are under video surveillance, inflammable goods, etc."

The arguments for coordinated signage remain valid for this proposal.

4.7 Protection of Utilities Infrastructure

The drawings indicate plant rooms and/or kiosks located on the roof of both buildings. Obviously there should be strict controls on accessibility and there should be CCTV monitoring of the entire plant room sub-precincts.

There does not appear to be any obvious exposure of power, gas or water mains or associated piping or cabling on Levels 3 to 8. However, from a security perspective, it is important that precise details of infrastructure, including communication cabling be recorded and retained within a central (ie whole-of-site) control room.

If during design development, exposure of infrastructure installations is necessary, such exposure should be roomed or, at least caged, to avoid any likelihood of intended or unintended damage.

4.8 Storage and Disposal of Documents

Ideally, there should be a standard policy for the safe storage and removal of commercially sensitive and personally sensitive documents, which should be developed by the tenants. Too often in commercial contexts, unwanted documents are simply dumped in street waste bins, in common-property waste bins or left on loading docks where they are vulnerable to unauthorised collection. It may be possible in the design to set aside a designated storage and disposal of document space or at least provide a common collection and clearing point.

The tampering and/or fraudulent use of documents or identity theft has become an urgent problem; hence this recommendation.

We also recommend that, where documents are to be archived, locked spaces should be designated on a tenant-by-tenant access basis. Unfortunately, internal fit-outs fail to specify secure space for these purposes.

4.9 Storage and Disposal of Waste

Waste/garbage storage can be targeted by arsonists or accidentally set alight. It is therefore important even in non-exposed waste removal areas, fire detection and fire sprinkler systems should be installed. We also note that the drawings provide for a lockable garbage room which is only accessible by staff. Ideally, this should be electronically access controlled but as a minimum, self locking hardware should be installed.

5 SECURITY DESIGN COMPLIANCE

It is essential that the security design initiatives for this proposal comply with the requirements of : (1) NSW Government legislation and guidelines and (2) requirements of the City of Ryde Council.

5.1 The NSW Government

The NSW Environmental Planning and Assessment (EPA) Act, 1979 allows for provision to be made for instruments to regulate or codify issues pertaining to environmental impacts of (normally) large scale and modest developments. Security (crime prevention) is one of the "impacts" allowed for.

Section 79C (1) states: "*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development, the subject of the development application*".

Section 79 (1) (b) adds: "…*the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality*".

Section 79 (1) (e) adds: "…*the public interest*".

The 2001 amendments to the interpretive guidelines for this Section state: "…*Crime prevention falls under these subsections of 79C. Councils have an obligation to ensure that a development provides safety and security to users and the community. If a development presents a crime risk, these guidelines can be used to justify:*

- *modification of the development to minimise the risk of crime, or*
- *refusal of the development on the grounds that crime risk cannot be appropriately minimised*".

5.2 The City of Ryde Council

While the Council has no specific reference to security design in any of its planning or policy instruments, there is scrutiny of commercial development applications to ensure that Safer-by-Design principles are incorporated into master-planning or detailed design-and-construct documentation. These principles are derived from the EPA legislation and are based on the CPTED model (**Appendix 2**).

Documents provided for development application (DA) in relation to Buildings A and B have been carefully reviewed in relation to compliance with EPA guidelines and CPTED.

We are satisfied that the security design has been incorporated into relevant aspects of the drawings to be submitted as part of the DA and/or will be further specified in design documentation. We believe that the client has taken into account a whole-of-site approach to security and security design. This proposed development's security design will complement that approach.

6 LOCAL CRIME RISKS

From our review of the drawings, there is no indication that the development's overall design is likely to cause, condone or promote anti-social or criminal behaviour.

The development does not constitute an increased crime risk to the immediate site or surrounding locality.

For information only, **Appendix 1** outlines recent and current crime trends for the City of Ryde LGA.

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7 REFERENCES

Atlas R, *21st Century Security and CPTED,* CRC Press, New York, 2008.

Australian Community Research Organisation, *Creating Perspective: A Blueprint for Crime Prevention and Community Safety, By the Community For the Community*, Reports 1 to 8, ACRO, Brisbane, 1998.

Coleman A, *Utopia on Trial*: *Vision and Reality in Planned Housing* H. Shipman, London 1985.

Crowe T, *Crime Prevention Through Environmental Design* Second Ed Butterworth-Heineman Boston 2001.

Geason S and Wilson P, *Designing Out Crime: Crime Prevention Through Environmental Design,* Australian Institute of Criminology, Canberra, 1989.

Newman O, *Defensible Space* Macmillan New York, 1972.

NSW Government, *Environmental Planning and Assessment Act, 1979*, Government Printer, Sydney 1980.

Turner + Associates, *Top Ryde Shopping Centre Redevelopment (Commercial)*, Sydney 2008
Drawing Schedule:

DA00	Cover Page Location Plan & Drawing Schedule	Revision K
DA01	Site Analysis Plan	Revision J
DA02	Site Plan	Revision K
DA20	Ground Level_Devlin Street [Lobby Fitout Only]	Revision L
DA21	Level 3 Plan (Parking)	Revision N
DA22	Level 4 Plan (Parking)	Revision N
DA23	Level 5-8 (Commercial Office, Typical)	Revision J
DA24	Roof Plan (Plant)	Revision K
DA40	Context Elevations_Devlin Street & Strada	Revision H
DA41	West Elevation (Devlin Street)	Revision K
DA42	South Elevation (Blaxland Street)	Revision G
DA43	East Elevation (Strada)	Revision H
DA44	North Elevation (Building A+B)	Revision G
DA45	Internal South Elevation (Building B)	Revision G
DA46	Section AA (Typical)	Revision F
DA47	Section BB (Typical)	Revision G
DA50	Building Envelope Analysis	Revision H

DA61	Area Schedule Diagrams	Revision J
DA70	Shadow Diagrams_June 21st (Part 1 of 2)	Revision H
DA71	Shadow Diagrams_June 21st (Part 2 of 2)	Revision H

APPENDIX 1: RYDE LGA CRIME STATISTICS

The following crime statistics are relevant to the Development. They are issued by the NSW Bureau of Crime Statistics and Research.

Recorded victims within the Ryde Local Government Area.	2003	2004	2005	2006	2007
Murder	2	0	1	0	1
Assault (domestic)	164	203	157	140	191
Assault (non domestic)	282	305	263	291	318
Sexual assault	25	20	24	26	24
Indecent assault/act of indecency/other sexual offences	39	57	46	68	80
Robbery without a weapon	58	53	44	72	40
Robbery with a firearm	15	10	10	9	12
Robbery with a weapon not a firearm	22	32	27	39	21
Break & enter – dwelling	738	569	414	436	525
Break & enter non dwelling	311	283	224	213	173
Motor vehicle theft	37	305	289	269	252
Steal from motor vehicle	647	630	545	615	703
Steal from retail store	253	249	302	283	345
Steal from dwelling	183	166	139	144	133
Steal from person	166	162	105	123	89
Arson	30	35	32	48	33
Malicious damage to property	772	835	777	896	865

Trends in Recorded Crime Statistics, 2003 to 2007

Offence Category	Annual percentage change 2006 to 2007	Average annual percentage change 2003 to 2007
Murder*	N.A.	N.A.
Assault - domestic violence related	Stable	Stable
Assault - non-domestic violence related	Stable	Stable
Sexual assault	Stable	Stable
Indecent assault, act of indecency and other sexual offences	Stable	Up by 19.7%
Robbery without a weapon	Stable	Stable
Robbery with a firearm	N.A.	N.A.
Robbery with a weapon not a firearm	Stable	Stable
Break and enter - dwelling	Stable	Down by 8.1%
Break and enter - non-dwelling	Stable	Down by 13.6%
Motor vehicle theft	Stable	Down by 9.6%
Steal from motor vehicle	Stable	Stable
Steal from retail store	Stable	Up by 8.1%
Steal from dwelling	Stable	Down by 7.7%
Steal from person	Stable	Down by 14.4%

Fraud	Stable	Stable
Malicious damage to property	Stable	Up by 2.9%

This table shows the results of statistical tests for a significant upward or downward monthly trend in the number of criminal incidents * recorded over 2 years and 5 years respectively, for selected offence categories. Where the trend is significant, the annual percentage change in the number of incidents is shown.

"N.A." indicates that the number of incidents recorded was too small for a reliable trend test to be performed.

* For murder, the trend test is applied to the monthly number of recorded victims.

Note: The statistics need to be treated with caution as they represent only reported crime, therefore, a number of categories may also show lower than actual incidents.

Further, it is important to note that changes in reported crime are significantly affected by two factors: (i) changes in the willingness of the public to report crimes to police, and (ii) changes in policing policy and practice.

The purpose of this statistical review is to note any upward crime trends. Such trends may be relevant in developing security design and/or security management plans for the redevelopment.

APPENDIX 2: CRIME PREVENTION AS A DESIGN STRATEGY

Rationale

Crime prevention has been linked to urban design since the late 1970s. The concept originated in the United States and Canada when sociologists, criminologists and architects began to link criminal behaviour in public spaces with poor design and layout of those spaces.

Today, there are four broadly defined models of crime prevention. They may be implemented individually, although ideally initiatives derived from each will overlap. The four models are:

Crime Prevention By Social Intervention – a model that sustains the integrity and safety of (often disadvantaged) communities through government and corporate and local support for programs, development initiatives and improvements to infrastructure.

Crime Prevention By Community Development – a model that encourages settled communities to develop partnerships in accepting responsibility for protecting personal and neighbourhood assets through a commitment to networking and sharing responsibility for community development goals.

Situational Crime Prevention – a model that focuses of place-specific crimes, targeting offences and offenders by pro-active and responsive security or law enforcement strategies.

Crime Prevention By Environmental Design – a model that incorporates aspects of architecture, engineering and technology to enhance the form, function and reputation of the built environment as “safe space”.

Crime Prevention Through Environmental Design (**CPTED**) is a coined version of the Crime Prevention By Design model; one that is takes a specific approach to reducing and preventing

crime by applying architectural design principles to urban developments which focus on territoriality, surveillance and access control. CPTED and the other models have largely been adopted throughout the developed world as legitimate crime prevention strategies.

Throughout the 1980s and 1990s, State and local authorities within Australia, responsible for urban development approvals, have been gradually adopting the CPTED or similar crime prevention (design) concepts when approving both large and small scale development applications.

Within Australia, there is recognition by all stakeholders involved in urban development, (however the term is defined) that designing out crime should form part of *mandated* development application criteria.

In 2001-2, the New South Wales Parliament assented to changes in guidelines under Section 79C of the EPA Act to include crime prevention as one of the "matters of public interest" which must be considered in approving development applications.

Increasingly, local authorities are introducing instruments and/or guidelines requiring 'security' to form part of DA documentation.

Notwithstanding local and State based regulatory requirements, it would seem prudent that developers seek to incorporate crime prevention-by-design guidelines to all projects, especially given the marketing and legal emphases on personal and community safety (security) Australia.

It is conceivable that, if built environments can be "secured" by adopting agreed crime prevention design guidelines, (protocols, etc.), then such guidelines will in time become mandatory in much the same way as Building Codes and Occupational Health and Safety standards have been adopted.

Incorporation of crime prevention architecture and engineering into relevant planning documentation throughout the design-and-construct stages is the ideal way to ensure compliance with local and State requirements.

Aims: Crime Prevention by Design

The broad aim of crime prevention design principles is to create and sustain safer communities by incorporating crime prevention design initiatives into all urban development.

From the literature, it is possible to identify two specific aims:

- To promote the legitimate and safe use of all natural and built environments by incorporating crime prevention or security design codes or guidelines into all development planning and approval processes.

- To enhance the reputation of developed environments by ensuring that crime prevention or security design criteria are integral to all architectural and engineering documentation submitted for review and approval by relevant authorities.

According to Atlas (2008:13), the emphasis of security design falls on the design and use of space, a practice that is different from the traditional approach to protecting property, 'target hardening'. Atlas suggests that security design or CPTED is based on three functions of human space:

Designation: what is the purpose or intended use of space
Definition: how is the space defined – social, cultural legal etc definitions
Design: is the space designed to support the prescribed or intended behaviours?

The Concept of "Defensible Space"

Oscar Newman (1972) coined the term. He developed the concept in relation to significant crime problems in high-rise ghetto type housing developments of New York City in the 1960s. Newman suggested that the urban design of inner city precincts was directly attributable to anti-social behaviour and high crime rates.

Newman recognised that there were three spatial issues that should be addressed in all future urban planning – territoriality, surveillance and access control. Each can be linked with architectural and/or engineering documentation in a coordinated approach towards making public and private spaces relatively crime free.

The Concept of Territoriality

It is essential to provide a sense of territorial definition and boundary limits from the first point of contact with any built environment design. That point of contact may be the front door of a building. It may be the off-road set back of an industrial estate, or it may be the main street – boulevard, divided road and/or entry statement – of a new sub-division. "On approach", the sense of definition of access and use should be evident.

Crowe (1999:37) suggests that the right physical design contributes to a positive sense of territorial use and ownership – a sense of territorial influence. In urban developments, territory may be defined or classified as public space, semi-private or communal space, restricted space and private or secure space.

Mixed use sub-divisions are particular cases in point. Each such development concept should flag spatial use and spatial hierarchy. This hierarchy should be evident as concepts, principles and foreshadowed specifics at the DA stage, to be followed by detail submitted throughout relevant aspects of design documentation.

The DA stage and design documentation architecture (and engineering) of vehicle or pedestrian corridors, commercial, retail, recreational, institutional, and residential precincts is as important as the architecture of the buildings that will eventually occupy those precincts. One without the other contributes to a sense of territorial confusion where territorial clarity is required.

Geason and Wilson (1989:5) claim that well designed housing projects make it clear which spaces belong to whom – some being completely private, some being shared and some public. Architects and developers of course claim that these aspects are always part of concept design, master planning and detailed documentation. The difference is that they are seldom designed to standards or principles aimed at repelling crime.

The Concept of Surveillance

Spatial design should maximise opportunities for surveillance – formal and informal. The design principle here is to increase the number and length of sight lines; the capacity of people and technology to observe movement and activity at distance.

The location, mass, height, proximity and form of buildings therefore become critical design features. The relationship of buildings to all open spaces and to roads, pathways, cycle-ways, parks and other streetscape forms is equally critical.

There are three agreed forms of surveillance that should be encouraged: *natural, social and technological.*

Natural surveillance encourages casual observation and monitoring of all users and owners of known and defined urban space.

Social surveillance encourages casual observers, through natural surveillance, to routinely monitor, challenge or report suspicious pedestrian and vehicle movements through precincts or into buildings.

Technological surveillance employs CCTV and other monitoring devices to alarm premises or spaces to deter/detect and respond to unlawful access or unlawful behaviour. In the past, analogue CCTV surveillance technology consumed personnel resources including managing the recording, e.g. replace tapes of these early systems. Network cameras and network video recording (NVR's) offers a more cost-effective alternative. Modern fast moving 'dome' cameras, which respond to alarm pre-set positions can be utilised. The 'alarm' may be a help call button being activated, a secured door being opened (using a door contact) or movement (using a passive infrared detector) and transmitted real time to wireless hand held technology.

The Concept of Access Control

Debate continues about ways to control, restrict or prevent access to buildings and to open precincts. The deployment of technology has been the recent favoured design strategy. This (in our view) over-reliance on technology has tended to limit creative physical design alternatives.

In the mid-1980s a significant study was carried out in the UK into some of England's (often referred to as) notorious or infamous housing estates – high and medium rise ghettos where crimes against property and people has been running rife.

The study by Coleman (1985) showed in part that there were numerous building and precinct design flaws which encouraged uncontrolled access to ill-defined spaces. Coleman suggested that gates, gaps, fences, landscaping, lighting, doorways, stairwells, steps, paths, seats, power poles coupled to ad hoc building design and poor definition of territory, not only attracted unauthorised access, but once access was gained, the various design flaws encouraged graffiti, vandalism, theft and assault.

The point of all physical (built environment) design from a crime perspective is to define and indicate purpose. For example a gate to a property must be positioned to indicate whether or not it is a main entry and, if so by signage, mechanical, electronic or other means, entry is generally allowed or is by permission only. A gate's design and integration with a fence or adjoining building gives some indication of who and how entry is to be gained.

Gates are usually the most common definers of territory, separating private and public space in industrial, commercial, institutional and residential precincts. There are some precincts without gates at their points of entry, thus inviting crossover to the next point of territory definition; ie a building, parking area etc.

While gates (and similar barriers) present as recognised objects for territorial definition and separation, crime prevention-by-design principles encourage broader and less intrusive definitional architecture; architecture which not only restricts or halts access, but which encourages entry, access and movement. Lighting, pathways, landscaping, low-line fencing, steps and doorways are obvious examples.

Coleman's study, highlights the need for developers to think holistically about distinguishing between legitimate (legal) access and users and occupiers of urban space and those seeking access illegally.

By applying crime prevention design principles to housing estates, to commercial, institutional and industrial complexes, to retail and recreational outlets and to transport infrastructure, there is more than one opportunity to clearly define appropriate entry and movement corridors.