



7 RAILWAY STREET,
CHATSWOOD

**CRIME PREVENTION
THROUGH ENVIRONMENTAL DESIGN
(CPTED)**

STATEMENT
JULY 2010

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1. INTRODUCTION

This CPTED Statement deals with the architectural design of the proposed mixed use development at 7 Railway St, Chatswood. The location of the proposed development is on the north-eastern corner of the intersection of Help Street and Railway Street. The site forms part of the Pacific Place development, which provides a mixed use development including commercial, retail, residential and public open space.

Development consent is now sought under a part 3A application for construction of a mixed use residential and commercial development with public open space area on the site. The mixed use development is proposed to comprise 304 residential apartments, some 3,800m²(GFA) of commercial area and 140m² (GFA) of ground floor retail. The residential component of the development will comprise 75 one bedroom units, 129 two bedroom units and 100 three bedroom units.

This report considers matters of security and security design in relation to the above application. It has been prepared following site inspections, review of relevant drawings and consultation with representatives of the design team.

From a regulatory perspective, the aim of the report is to determine if the following security objectives have been met; specifically whether:

- The development follows the Department of Planning Environmental Planning and Assessment Act (1979) guidelines, namely 'Crime Prevention and the Assessment of Development Applications'. These guidelines are based on Section 79 C(1)(e) which considers crime prevention a possible 'impact' falling within 'the public interest'

From a commercial perspective, the aim of the report is to support and recommend solutions that will enhance the development's security objectives by:

- Maintaining the architectural integrity and commercial objectives of the project;
- Improving marketability by promoting a 'safe space' reputation; and
- Reducing overall legal liability through the application of best practice crime prevention design and other measures.

This scope reviewed the proposed project (the development) as a part 3A application to the Department of Planning (DoP). Specifics include:

- Conducting a review of documentation to be submitted for the development application (DA), the review to identify the design strengths and potential for reducing crime risks;
- Ensuring compliance with the security requirements of Council and or/ other planning instrument, including the requirements of Section 79C of the Environmental Planning Assessment Act (EPA Act);
- Assessing the local environment in terms of crime risks or trends and their likely impact on the commercial goals of the development;

- Affirming appropriate security design strategies, and or recommend possible changes to aspects of the development's design, likely to enhance the projects security objectives.

In the context of this review, we define 'security design' as "an environmental crime prevention strategy applying to aspects of architecture, engineering and technology and all urban development proposals". The principles of "security design" are underpinned by Crime Prevention Through Environmental Design (CPTED); a mainstream crime prevention strategy applied to medium and large scale urban developments. Local and State authorities throughout Australia have adopted CPTED principles as apart of planning instruments relating to the security of built environment proposals.

The review acknowledges that, should the project be approved, construction documentation will reflect the specifics of security issues raised and the solutions, or apparent, in drawings submitted as part of the Environmental Assessment.

2. BRIEF OUTLINE OF AREA UNDER REVIEW

The following areas have been assessed in terms of safety and security, surveillance, access control, territorial enforcement and space management. The areas that have been identified, reviewed and considered for safety and security within the proposed development are:

- Shared access driveway
- Underground carpark
- Site through link
- Public Open Space
- Open Spaces above the Railway Enclosure Structure
- Residential Amenities
- Residential Tower
- Commercial Podium

2.1 SHARED ACCESS DRIVEWAY

In accordance with the approved Pacific Place Masterplan for the site, vehicular access arrangements and servicing to the proposed development will be provided from Railway Street via a driveway shared with the adjacent Epica building which provides access to the Epica building service area and will provide access to the basement parking and service area for the proposed development. The two way access driveway has been designed to provide for cars and service vehicles ranging from small commercial vehicles to medium rigid trucks, with a height clearance of 3.5m. A loading dock has been provided on the upper basement level and will provide for service vehicles to enter and exit in a forward direction.

2.2 UNDERGROUND CARPARKS

Carparking will be provided within 7 basement levels. Incorporated with the carpark is a shared loading facility for the commercial and residential uses. The loading and services facilities, commercial retail and visitor parking are available on the upper basement level. Private residential carparking spaces are accommodated on the remaining lower levels. Access to carparking spaces will be provided from a 6 metre wide two way traffic aisle circulating through the various parking levels. Access between the parking levels will be provided by a combination of ramped floors and two way vehicular ramps.

2.3 SITE THROUGH LINK

The through site link nominated in Section I.6 of Willoughby DCP 2005 will be provided as part of this Project. The provisions of the DCP are based upon the original master plan adopted for the Pacific Place site. The existing pedestrian tunnel below the RES connects the west and east ends of the development site and provides a public passageway or through site link for the proposed landscaped amenity at ground level.

As addressed by JBA Urban Planning's letter to the Department of Planning (dated 4th March 2010) council requires the through site link to be maintained. Council considered that the Help Street presentation and amenity is poor, the preference to

maintain the site through link would help activate the street frontages. The existing pedestrian path on Help Street under the railway is currently used consistently but by a relatively small number of pedestrians. It is not a very attractive or safe route and presents a significant risk to public safety and security of the development proposal. Inspection of the link in its present condition raised questions as to its potential value. Further investigation suggests that improvements to the site through link may help activate the open spaces on both sides, rather than these being 'dead-end' spaces.

2.4 PUBLIC OPEN SPACE

A landscaped public open space located to the north and east of the residential building also forms part of the development proposal together with an additional area of landscaping located on top of the Railway Enclosure Structure (RES) currently approved under the original DA Consent (refer to Section 2.5). The landscape area of the proposed development can be described in 3 primary parts. The east facing the RES wall and adjoining the public plaza area, referred to as the 'Eastern Plaza'. The publicly accessible park space and the private open space on top of the RES referred to as the 'Upper Plaza' and the western facing RES wall referred to as the 'Western Plaza'. The primary ground plane of the Western Plaza falls approximately 1.3m from Railway street east to the pedestrian tunnel entry and approximately 3m from the north western site boundary to the pedestrian tunnel entry. The raised form of the sub grade car park entry tunnel will form part of the Western plaza and will be utilised to form the proposed landscaped terraces.

2.5 OPEN SPACE ABOVE THE RAILWAY ENCLOSURE STRUCTURE (RES)

The Council masterplan nominates the area at podium level above the Railway Enclosure Structure (RES) as public open space. The masterplan envisaged the podium to be an area of landscaped public open space providing amenity to the pedestrians passing through the site. An elevator on the eastern side provides access to the top of the RES but the area is not currently accessible to the public and is fenced off.

Public Open space will be provided above the RES via a new access point on its western side. As the space will not be seen as a destination by pedestrians or workers in the CBD area, the space has greater value as communal open space for residents of the proposed development as well as existing residents of the adjoining Epica, Cambridge and other Pacific Place residential buildings.

An independent evaluation conducted by Emeritus Professor G.P Webber (appended to JBA's letter to the Department of Planning) on the provision of public opens space on top of the RES concluded that residents of the building will have physical access to the space at podium level and the open space will soften the railway infrastructure and provide a high level of visual amenity to residents in buildings adjacent to and above the space. As public space it would have limited use and would almost certainly need to be secured after dark in accordance with a management plan. As communal space it will provide a very attractive amenity for existing and future residents with access provided from level 5 of the proposed new apartment building

In line with Council Requirements the northern Upper plaza on top of the RES has been made publicly accessible as part of the current proposal.

2.6 RESIDENTIAL AMENITIES

Consists of communal amenities for the residential tower including the communal private open space created to the southern Upper Plaza on top of the Railway Enclosure Structure. It will be accessed from level 5 of the proposed building by both stairs and an open wheelchair platform and includes barbecue, seating and planted areas providing a place for residents to gather, providing a sense of community within the residential building. There is also an indoor swimming pool and gym on the ground level that forms part of the residential amenities. These facilities will provide the foundations for creating community interaction between residents within the development.

2.7 RESIDENTIAL TOWER

The proposal is for a single tower structure comprising ground floor and 42 floor levels above including roof plant and podium levels. There are three typical residential floor plates which provide diversity of apartment types and sizes. The mixed use development is proposed to comprise 304 residential apartments located on levels 5 - 42. The residential component of the development will comprise 75 one bedroom units, 129 two bedroom units and 100 three bedroom units.

The tower will sit on a 4 storey podium base, which will address Railway and Help Street. It will also form the built edge to the new public park. The tower will act to overlook and provide surveillance to the park. The entrance to the residential building lobby at ground floor is adjacent to the park, providing 24 hour activation with direct connections to the underground Car parking facilities and residential amenities.

2.8 COMMERCIAL PODIUM

The 4 storey podium contains lobbies and retail at Ground level and three levels of commercial space above of approximately 1250 sqm GFA per floor. The main body of the commercial podium is aligned to the street creating a clearly defined edge. At the ground plane the footprint pulls in providing for a covered colonnade varying from 2 to 5 metres in depth and height from 3.8 to 5 meters.

Separate commercial and residential lobbies have been created. The commercial entry is further along Railway Street, assisting in bringing people further into the site and activating the precinct. The location of the retail and commercial entry off Railway Street encourages pedestrian activity and forms a natural pathway to and from the train station while activating the corner of Railway and Help Street.

The commercial component is serviced by separate lifts to the residential component and separate stairs have been provided to the commercial levels.

3. CPTED PRINCIPLES

3.1 ACCESSIBILITY CONTROL

This CPTED principle involves the management of movement and control of access and egress in normal and after hours operation. It involves the ability to secure certain areas to prevent trespass, while making accessible other areas to legitimate users.

The ability to effectively secure the site through link and the proposed public open space above the railway enclosure structure after hours is a critical design consideration. Good circulation design, which will provide users with short, clear and unambiguous direction of travel, encourages purposeful movement and deters loitering. This shall be augmented by clear signage and good illumination levels.

3.2 SURVEILLABILITY

One of the fundamentals of CPTED is the issue of surveillability. Natural surveillability relates to the ability to see and be seen and this is achieved through good planning, elimination of blind corners, strategic placement of windows, exits and entrances, etc. which will provide uninterrupted sightlines. With the addition of good lighting, such measures will be an effective deterrent to crimes being committed because the level of exposure and risk potential of being seen is high.

3.3 TERRITORIAL REINFORCEMENT

Territoriality refers to a sense of ownership of the facility by the owners and the Public, which is based on the theory that people generally will look after that facility if they have some vested interest in it. Designs that encourage the Public to gather and use the space also encourages them to feel some responsibility for its use and condition.

Territories should be well defined so that there are clear transitions and boundaries between public and private space. In addition, clear design cues should be introduced as to what the space is to be used for and by whom. It should be noted that territorial reinforcement is devalued if public space is accessed through gates or other barriers.

3.4 SPACE MANAGEMENT

Space Management relates to activity co-ordination; site cleanliness; the rapid repair of vandalism and graffiti; the replacement of burned out lighting throughout the Development; the upgrade and refurbishment of decayed physical elements. Graffiti and vandalism and low levels of illumination are signs of malaise and 'colonisation' by illegitimate users. The appropriate selection of vandal resistant materials and equipment, coupled with the regular upkeep of the facility is critical in maintaining rightful ownership of it.

4 STATEMENT & RECOMMENDATIONS

4.1 SHARED ACCESS DRIVEWAY

4.1.1 Vehicle Entry Point

Access to the site is via a shared drive way with the Epica building which services the Epica service and loading bay. The driveway and associated structure are located on the title of 7 Railway Street with an easement in place benefiting Epica with the right of access to the Epica service and loading bay area.

The existing driveway to the Epica service and loading bay was designed to enable access to the future 7 Railway Street development and as part of the construction of the basement for 7 Railway Street, there will be a requirement to remove a temporary wall which was installed in the Epica service and loading bay area, in order to create the access to the basement of 7 Railway Street.

Accessibility Control: All vehicle entry points shall be fitted with roller shutters operated by a remote control. An intercom system shall be fitted to allow authorised visitors access to the car park.

Surveillability: All vehicle entry points shall be well lit to deter intruders. Where practicable, recesses and blind corners have been eliminated.

Territorial Reinforcement: Clear boundaries between the Epica service and loading dock entry and the proposed entry to 7 Railway Street have been defined.

Space Management: Vandal resistant materials and equipment will be specified to the public areas

4.2 UNDERGROUND CAR PARK

Car parking is outlined in a detail Traffic Report prepared by CBHK accompanying this submission and will be accommodate 395 spaces in 7-basement car parking floors below ground.

4.2.1 Service & Loading, Commercial, Retail and Visitor parking

Accessibility Control: The loading and services facilities, commercial, retail and visitor parking for the proposed development are provided on Basement Level 1 separated from the residential car parking by a security gate. There will also be a security gate at the main access to the ramp at street level. Access and egress to and from the car parking and loading areas will be from a 6 metre wide two way ramp off Railway Street.

All vehicle entry points shall be fitted with roller shutters operated by a remote control. An intercom system shall be fitted to allow authorised visitors access to the car park.

The retail, commercial and visitor carparking spaces have been clearly defined by the use of control access points. The loading and unloading facilities and main incoming services are contained at Basement Level 1.

Surveillability: All vehicle entry points, loading and service facilities and parking areas shall be well lit to deter intruders.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

Space Management: Access to the car park by trades and delivery persons shall be managed to prevent unauthorized entry.

4.2.2 Residential parking

Accessibility Control: The residential component of the mixed used development comprises 304 apartments. Private residential carparking spaces are accommodated on basement levels B2 – B7 and separated from the commercial, retail and visitor parking by a security gate. Access to residential private parking shall be fitted with roller shutters operated by a remote control. Access to carparking spaces will be provided from a 6 metre wide two way traffic aisle circulating through the various parking levels. Access between the parking levels will be provided by a combination of ramped floors and two way vehicular ramps.

Access to residential private parking shall be fitted with roller shutters operated by a remote control.

Surveillability: All private residential parking areas shall be well lit to deter intruders.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

Space Management: Access to the residential car park shall be managed to prevent unauthorised entry.

4.2.3 Fire Stairs and Fire Corridors

Accessibility Control: Fire stairs and corridors are areas of potential risk particularly where they discharge onto public areas. The potential for concealment increases the opportunity for crime. The fire doors shall be alarmed to discourage unauthorised use.

Surveillability: Fire Stairs and Corridors shall be well lit to deter intruders. Where the stairs discharge onto public space, access from the outside shall be key operated and will remain permanently locked. Where practicable, recesses have been eliminated to prevent areas of concealment.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

4.2.4 Residential Lifts

Accessibility Control: The car park incorporates loading/unloading facilities for the all commercial and residential floors, and includes parking for Retail and all main incoming services. Consequently, access to the residential lift lobbies and/or the lift cars shall be key or remotely operated to deter intruders. An intercom system shall be fitted at Basement 1 to allow authorised visitors access to the lifts, lift lobby and residential levels.

Surveillability: The car park shall be well lit to deter intruders.

Territorial Reinforcement: Clear boundaries between public and private space have been defined. 4 Residential Lifts provide direct connection to the private residential carparking spaces level B2 – B6 and the residential visitor spaces provided on Basement 1. No commercial lifts connect to the residential carparking levels. The residential lifts are accessible from the shared loading facility.

Space Management: Access to the residential lifts by trades and delivery persons shall be managed to prevent unauthorised entry.

4.2.4 Commercial Lifts

Accessibility Control: To prevent unauthorised access to the commercial floors on Levels 2 - 4 and unauthorised access to the commercial lobby on Level 1 (Ground Level), all commercial lift cars shall be key activated or remotely operated to deter intruders.

Surveillability: The car park and lifts shall be well lit to deter intruders.

Territorial Reinforcement: Clear boundaries between public and private space have been defined. 2 commercial lifts provide direct connection to the commercial carparking spaces provided on Basement 1 and do not connect to the residential private parking areas. The commercial lifts are also accessible from the shared loading facility.

Space Management: Access to the commercial lifts by trades and delivery persons shall be managed to prevent unauthorised entry.

4.3 SITE THROUGH LINK

The through site link nominated in Section I.6 of Willoughby DCP 2005 will be provided as part of this Development. The provisions of the DCP are based upon the original master plan adopted for the Pacific Place site.

The existing pedestrian tunnel below the RES connects the west and east ends of the development site and provides a public passageway or through site link for the proposed landscaped amenity at ground level. Professor Webber provided an independent evaluation in February 2009 on the provision of a through site pedestrian access under the railway enclosure structure. The evaluation concluded that the inspection of the link in its present condition raised questions as to its potential value to the overall development of the site. The issue of safety of users of the walkway link during evening hours remains a potential concern. (Reference to be made to Emeritus Professor G.P Webbers report appended to JBA's letter issued to the Department of Planning 4th of March 2010).

JBA indicates that Council requires the through site link to be maintained. Council considered that the Help Street presentation and amenity is poor, the preference to maintain the site through link would help activate the street frontages. The existing pedestrian path on Help Street under the railway is currently used but by a relatively small number of pedestrians. It is not a very attractive or safe route and presents a significant risk to public safety and security of the development proposal.

Accessibility Control: Improvements to the site through link may help activate the open spaces on both sides, rather than these being 'dead-end' spaces. The issue of safety of users of the walkway link during evening hours can be addressed by restrictions being placed on access to the link during evening hours with the use of barriers.

Surveillability: The pedestrian underpass may be improved through good lighting and durable surfaces. The ground floor and public open spaces have been designed to ensure activation of the street and the through site link. The geometries proposed at ground level create desire lines to the through site link and the location of the residential entry and pool provide activation and surveillance.

Good sight lines to the entrances on both sides of the site through link has been provided allowing unhindered passive surveillance from buildings and spaces. A gentle gradient for disabled access is achievable with the new development providing active frontages immediately adjacent the link

Territorial Reinforcement: The site through link is considered public open space and will be restricted to the public after daylight hours.

Space Management: The Pacific Place masterplan is silent on the ownership and management of the link. A management plan would need to be implemented and controlled by 7 Railway St. With careful design and appropriate management the through site link could be available as a safe route at restricted hours of the day.

4.4 OPEN SPACE

4.4.1 Western Plaza

Accessibility Control: The new public park sits to the North of the proposed building maximising the opportunity for solar access. It is envisioned as high quality amenity for surrounding businesses and residents. The design of the western plaza responds to and enhances the existing pedestrian use patterns as well as existing pedestrian networks. The basic structural geometry encourages public access through the site increasing permeability and the connection along Railway Street to the through site link. As noted in Section 4.3 the issue of safety of users of the walkway link during evening hours can be addressed by restrictions being placed on access to the link during evening hours with the use of barriers.

The new public park consists of a series of planted terraces and activity zones providing for a varied experiential quality with a stairway leading to a garden on top of the Railway Enclosure Structure. As this northern upper plaza space will not be seen as a destination by pedestrians or workers in the CBD area it would have limited use and would almost certainly need to be secured after dark in accordance with a management plan. (Refer to Section 4.5 for additional detail).

Surveillability: Adequate external lighting is to be provided to the proposed open spaces. The new mixed use development will form a built edge to the Western Plaza. The tower will act to over look and provide surveillance to the park. The entrance to the residential building lobby at ground floor is adjacent to the park, providing 24 hour activation with direct connections to the underground Car parking facilities and residential amenities.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

Space Management: A management plan is to be implemented to restrict access to the site through link and public landscape areas above the RES after daylight hours. Skateboard deterrent devices will be installed where appropriate.

4.4.2 Eastern Plaza

Accessibility Control: The eastern plaza is proposed as a public open space which will compliment the existing civic space adjacent the existing Cambridge building. A raised passive recreation platform is located to the south of the eastern entry of the pedestrian tunnel. The outer edge of this platform is formed to provide ample and varied seating opportunities for residents and workers in the area. The Eastern Plaza is connected to the Western Plaza via the existing Site Through Link at ground level below the RES. As noted in Section 4.3, the issue of safety of users of the walkway link during evening hours has been identified as a potential concern and would almost certainly need to be secured after dark in accordance with a management plan. (Refer to Section 4.5 for additional detail).

There is an existing lift providing public access from Cambridge Lane to the top of the Railway Enclosure Structure. It is recommended that public access be restricted after daylight hours to the upper plaza to deter intruders in accordance with a management plan (Refer to Section 4.5).

Surveillability: The Eastern plaza shall be well lit to deter intruders. The new mixed use development and surrounding residential developments (Cambridge) will act to over look and provide surveillance to the plaza. In addition to this, the entrance to the residential building lobby for Cambridge with existing retail at ground level will also provide activation and natural surveillance at ground level. To avoid vandalism of the base of the RES wall, a generous planting bed provided to support a row of vigorous twining climbers are proposed on a fabricated support structure sitting off the face of the RES wall.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

Space Management: Management Plan to be implemented to restrict access to the site through link and public landscape areas above the RES after daylight hours.

4.5 OPEN SPACE ABOVE THE RAILWAY ENCLOSURE

4.5.1 Upper Plaza.

The Council masterplan nominates the northern area at podium level above the Railway Enclosure Structure (RES) as public open space. It is presently accessible by an elevator on the eastern side but the area is not currently accessible to the public and is fenced off. The masterplan envisaged the podium to be an area of landscaped public open space providing amenity to the pedestrians passing through the site. This was relevant at the time of the masterplan as an overhead pedestrian link bridge was proposed over Help St to link the public open space above the RES with the new Interchange upgrade. Subsequently, the bridge proposal has been abandoned.

The design of the Upper Plaza area can be considered in two parts although the overall design has been set out to create a unified perception of the space from the Upper Plaza itself but also looking down from any nearby buildings. The northern portion of the upper plaza is proposed as public park space. The Southern portion of the Upper Plaza is proposed as private break out space for the proposed development accessible from level 5. It is set out with extensive lawn areas and a BBQ deck area set amongst planting. In line with Professor Webbors evaluation, the residents of these buildings will have physical access to the space at podium level and the open space will soften the railway infrastructure and provide a high level of visual amenity to residents in buildings adjacent to and above the space. As public space, the northern upper plaza would have limited use and would almost certainly need to be secured after dark in accordance with a management plan.(refer to Emeritus Professor G.P Webber Evaluation dated February 2009).

It is envisaged that the public open space above the Railway Enclosure Structure will not be seen as a destination by pedestrian or workers in the CBD area. The space has greater value as communal open space for residents of the proposed development as well as existing residents of the adjoining Epica, Cambridge and other Pacific Place residential buildings. Mirvac have expressed that as communal space it will provide a very attractive amenity for existing and future residents of Pacific Place and 7 Railway St.

Whilst Mirvac believe that access to the landscaped open space of the northern upper plaza (above the RES) should be limited to the existing Pacific Place residents and residents of the new 7 Railway Street development, the current proposal accommodates a public park space on the northern portion of the plaza.

To evaluate the potential impacts of the public open space above the RES, and the likely effects on the residential amenity within Pacific Place, a management plan shall be implemented to address the following:

Accessibility: There is an existing lift providing public access from Cambridge Lane to the top of the Railway Enclosure Structure. It is recommended that public access to the public open space above the RES be restricted to secure the area after daylight hours.

The new Western Plaza consists of a series of planted terraces and activity zones providing for a varied experiential quality with a stairway leading to the accessible public space above the Railway Enclosure Structure. As public space the Northern Upper Plaza would have limited use no matter how well landscaped and would almost certainly need to be secured after dark in accordance with a management plan. Public access restriction shall be imposed on the new public stairway to secure the area after daylight hours.

Surveillability: Adequate external lighting is to be provided to the proposed public and private open spaces above the RES. The proposed tower and surrounding residential developments will act to over look and provide surveillance to the top of the RES.

Territorial Reinforcement: Clear boundaries between public and private space have been defined. A secure 1.8 m fence with key access will separate the northern (public) portion & the southern (private portion of the Upper Plaza).

Space Management: Vandal resistant materials and equipment will be specified to the public areas.

Based upon safety, security and surveillance concerns, in undertaking its determination of the proposed development it is recommended that the Department of Planning give consideration as to whether or not the landscaped open space above the RES (Northern Upper Plaza) be made accessible to the public or whether this space should be communal space accessible by the residents of Pacific Place & 7 Railway Street comprising some estimated 2500 residents.

4.6 RESIDENTIAL AMENITIES

Accessibility: These areas are secure from public access and are only accessible by key access. All fire discharge staircases and lift lobbies have the flexibility to be manned or are kept locked.

Surveillability: The pool and gym facilities are located on the ground level with a glass frontage to the Western Plaza which encourages natural surveillance in and out. All fire doors are alarmed.

Space Management: Vandal resistant materials and equipment will be specified to the public areas.

4.7 RESIDENTIAL TOWER

Accessibility: All residential floors are accessible from the ground level lobby and basement carpark levels. Consequently, access to the residential lift lobby and/or the lift cars shall be key or remotely operated to deter intruders. An intercom system shall be fitted to all apartments to allow authorised visitors access to the lifts, lift lobby and residential levels. Fire stairs and corridors are areas of potential risk particularly where they discharge onto public areas. The potential for concealment increases the opportunity for crime. The fire doors shall be alarmed to discourage unauthorised use.

Surveillability: Residential lift Lobby and common circulation spaces shall be well lit to deter intruders.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

Space Management: Vandal resistant materials and equipment will be specified to the common residential areas

4.8 COMMERCIAL PODIUM

Accessibility: All commercial floors are accessible from the ground level lobby and basement carpark levels. Consequently, access to the commercial lift lobby and/or the lift cars shall be key or remotely operated to deter intruders. Fire stairs and corridors are areas of potential risk particularly where they discharge onto public areas. The potential for concealment increases the opportunity for crime. The fire doors shall be alarmed to discourage unauthorised use.

Surveillability: Commercial Lift Lobby and common circulation spaces shall be well lit to deter intruders.

Territorial Reinforcement: Clear boundaries between public and private space have been defined.

Space Management: Vandal resistant materials and equipment will be specified to the common commercial areas

5 LIGHTING

5.1 LIGHTING DESIGN

A lighting design approach which satisfies all CPTED principles applies to all areas of the development proposal. The successful lighting design must achieve the following:

- Lighting shall provide a wide and even spread of illumination which provides visibility from as far away as possible. Good sightlines become ineffective if illumination levels are poor. Good lighting is an essential ingredient of survivability as it allows us to see and be seen, and gives us the opportunity to take evasive action if required.
- Lighting shall provide an appropriate lux level: Nightsafe Areas min. 150 lux. Entrances: 150 lux. Carparks: min. 150 lux. The above represent only minimum levels. The desirable level of lighting is in the order of 200 - 500 lux.
- Light fittings shall be positioned to eliminate shadows cast by surrounding elements.
- Lighting levels shall be adequate to meet operational requirements.
- Luminaires shall be robust and vandal resistant.
- Internal finishes to surfaces shall be highly reflective where practicable to improve the overall illumination level.